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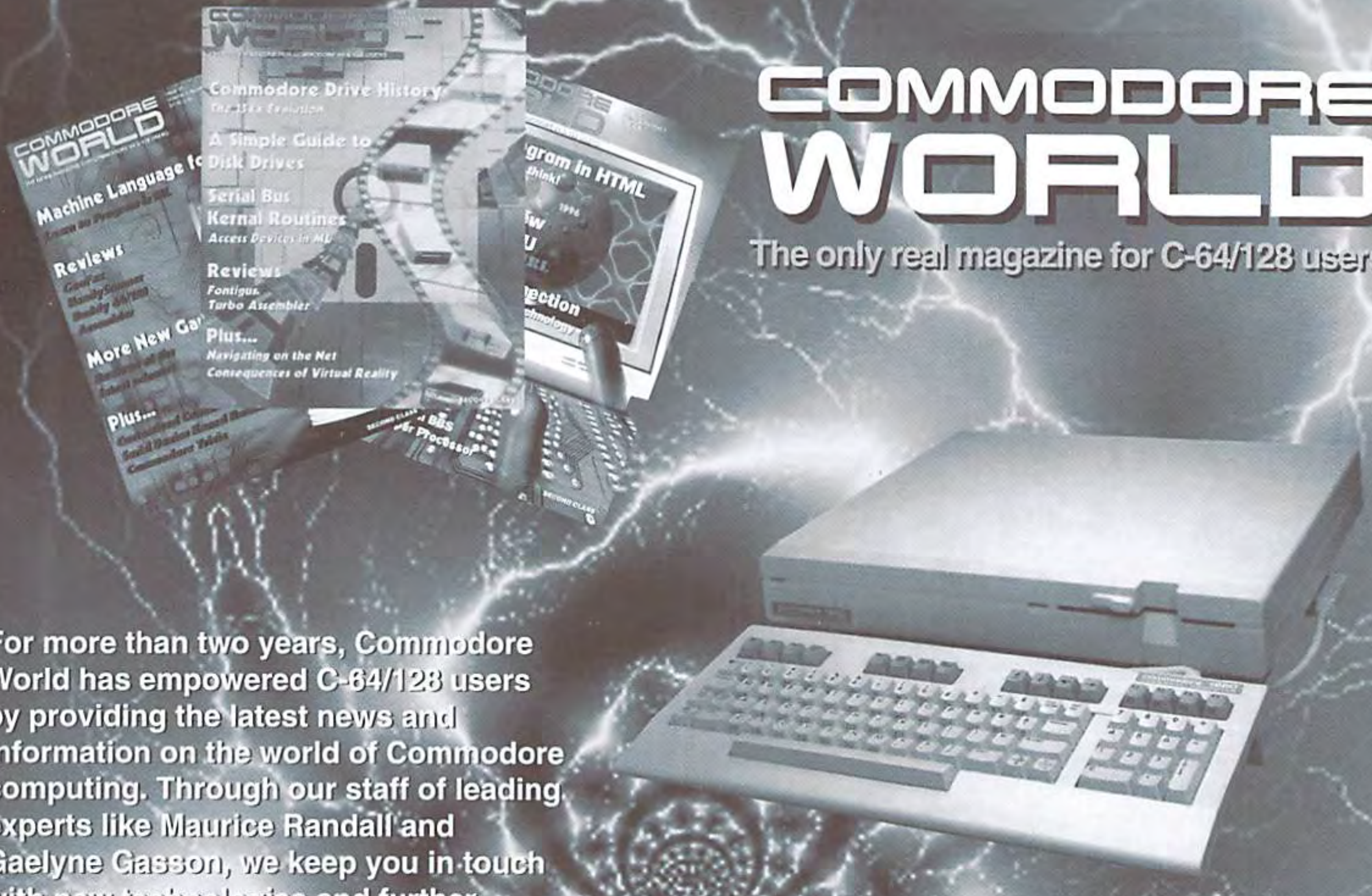
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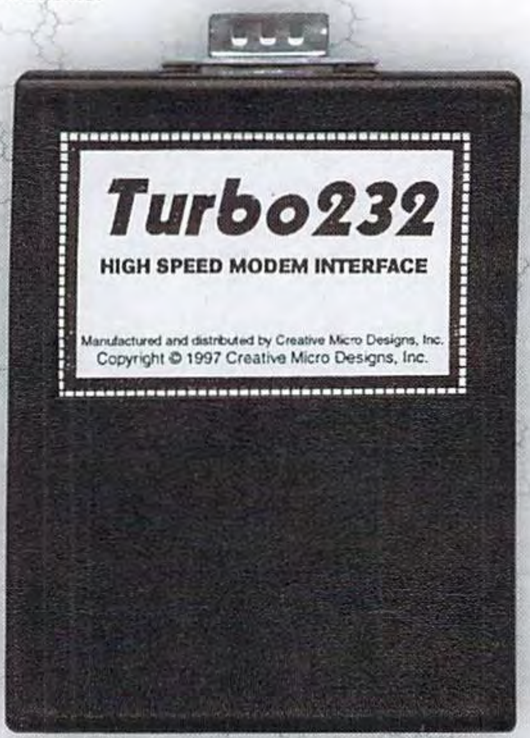
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THE NEWS MAGAZINE FOR COMMODORE 64 & 128 USERS

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FROM THE EDITOR

Hi. Yes, I'm down here! Okay, here we go—we've freed up some space in the rest of the magazine. Sadly, since a couple of columns ran rather long, we were unable to bring back a couple of other columns for this issue: BASIC Instincts and Assembly Line; those columns will be given priority in our next issue, which is already in production.

You'll also notice that the text in On The Horizon got a bit small... we had even more news items, but had to pass on some. If the size is a problem, please drop us a line and let us know.

Meanwhile, I'm excited about some of the items in this issue; the 1581 modifications (Hard Tips), the new BASIC extensions for the SuperCPU (816 Beat), and news about the upcoming Concept SC assembler from Maurice Randall (On the Horizon). I hope you'll share in that excitement.

One other thing bears mentioning. You'll notice on the CMD Specials page (p. 17) in this issue that we're running a special price on the CMD 1750XL REU, but that the price is good only for Commodore World subscribers. In future issues we'll be running additional specials just for you, our faithful readers. It's our way of saying 'Thanks!'.

Doug Cotton
Editor

ON THE HORIZON

COMMODORE AND COMPUTER INDUSTRY NEWS

Inner Space Anthology Includes C128 Memory Maps

The Complete Commodore Inner Space Anthology is a collection of reference material for Commodore computers. It contains no reading--just page after page of charts and tables, including: command summaries for BASIC, COMAL, ML; Jim Butterfield's memory maps for the PET, VIC20, C64, C128, and the 4040, 8050 and 1541 disk drives; machine language monitor commands; PAL and CBM assembler commands and .opt directives; addresses of user callable ROM suboutines; Jim Butterfield's "SuperCharts"; disk drive file header and sector format information; SID chip note values; color codes, video chip data and video memory maps; character and sprite design templates; hardware port pinouts and transfer sequences; and IC chip pinouts. The book also contains several indirectly related charts and tables

Originally printed in March 1985, a second print run followed shortly afterward. In August 1986 the film and plates were destroyed in a flood. The current version of this book is made up of re-scanned and touched up pages from an original. Prices for the book (including shipping) are: US $10.00 (US addresses) and Cdn $15.00 (Canadian addresses). All others may contact the distributor.

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LACC Annual Expo

The Lansing Area Commodore Club will be holding it's annual Commodore Expo on Saturday, May 1, 1999, from 10 AM to 4 PM at the Meridian Township Service Center in Okemos, MI. For directions and further information check out the Speed Zone BBS (517-322-2386) or Maurice Randall's website (http://people.delphi.com/arca93/). Slated for the show is a demonstration of the new geoShell for Wheels.

Wheels 128 Released

Maurice Randall (Click Here Software) has begun shipments of Wheels 128, the GEOS 128 upgrade that replaces the GEOS 128 Kernal, deskTop and other assosciated utilities. The 128 version builds on the original Wheels 64, adding 80-column color to the Dashboard (the deskTop replacement) and providing a 'Detail Shop' where you can customize things like the colors and background pattern. Wheels 128 even includes a mouse pointer editor that will allow you to customize the 80-column mouse pointer. Many other improvements and enhancements were added to Wheels 128. So many, in fact, that Maurice has also released a Wheels 64 update to bring this older version up to par with the new 128 release.

Both Wheels 64 ($36.00) and Wheels 128 ($40.00) are presently available dirctly from Maurice and CMD. For additional details about Wheels 128, see the feature article elsewhere in this issue.

What a Concept!

Maurice Randall has also recently released *Concept*, an all-new programming tool for Wheels 64 and Wheels 128. Concept is an assembler and linker integrated into one program which runs in the Wheels 64 or Wheels 128 environment (in either 40- or 80-column mode). Concept loads entirely into memory to make assembling and linking faster—all assembler and linker modules are loaded into memory at one time.

Concept installs itself as your default desktop while in use. This allows you to launch geoWrite for source editing, then return directly to Concept to assemble and link your code. Concept can be used to create anything from small GEOS or Wheels programs up to the largest of applications. In fact, Concept was used to create the latest Wheels 64 upgrade.

In addition to this current release of Concept, Maurice has also announced that he is working on an advanced version for the CMD SuperCPU, dubbed *Concept SC*. This version will require a SuperCPU running with Wheels 64 or Wheels 128 and at least 1 MB of SuperRAM (this requirement may be increased to 4 MB by the time project is completed). Concept SC will perform all assembly and linking directly in memory prior to writing any files disk. This will further speed development over the current version which must interactively read and write small portions of the source and destination (.rel) files in order to complete assembly. The linking process will be enhanced in a similar manner.

Concept SC will also remove many of the limitations imposed by the current system. Symbols and labels will no longer be limited to only the first 8 characters being unique—all 20 characters will be checked. In addition, the number of symbols will be more or less unlimited, depending on the amount of RAM available in the SuperCPU.

The initial release of Concept SC is due out soon, and the program will gradually evolve by adding new capabilities. One ability that has been announced is the ability to generate full 65816 code. Maurice has also indicated that Concept SC could eventually develop into the main core of a more enhanced programming environment.

Centipede Released to Public Domain

Adam Fanello of Bugsoft has announced that Centipede, a BBS program for the Commodore 128, has been dropped as an active product line of Bugsoft. The announcement came as a result of a hard drive failure that destroyed Bugsoft's production method for the product. It was further stated that "the lack of sales and a shortage of interest made reworking and rebuilding unworthy of the time commitment."

Centipede BBS, as well as its predecessor V128, are now a part of the public domain. Fanello stated that users are "free to share Centipede with [their] friends" and "free to take pieces of Centipede and use them in [other] programs. All parts of Centipede are now a part of Commodore public knowledge. Enjoy."

For additional information, users are directed to visit the Bugsoft website (http://www.bugsoftware.com/centipede/free.html).

VideoCam Services Offers Telnet Service and New Book Pricing

VideoCam Services is pleased to announce new a new telnet service designed specifically for Commodore users. In many areas in the US and around the world, Commodore users are able to access the Internet locally, but have found a lack of support from their Internet providers.

By telneting to use a Commodore-friendly service, members can enjoy learning about the Internet with friendly support and guidance. To cover expenses in providing this service, a yearly membership fee of $30.00 Australian, (or $19.95 US if paying by US check) will be required.

Members are able to send and receive Email, access the World Wide Web with Lynx (optimised for colour), use our CBM FTP site, read Commodore related newsgroups (including local groups for members only), and have access to IRC (Internet Relay Chat). Other utilities to enhance Commodore computing and Internet use are also available.

VideoCam Services has also announced that "The Internet for Commodore C64/128 Users" manual is now available at a lower price. The new single price is $29.95 Australian, or $19.95 US if paying by US check. Bulk order prices have also been reduced.

For more information, contact Gaelyne or Rod Gasson (Email: admin@videocam.net.au, Web: http://videocam.net.au, Phone: +61 8322-2716, Fax: +61 8387-5810).

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ON LOADSTAR ISSUE #176

A partial table of contents *squeezed* in!

Basics: Hymn 2k: by Larry Schafer. A parody of the "Battle Hymn of the Republic" for the year 2000.

Centsible Software List: A list of new and used software available from the world's largest 8-bit software company.

Toon -- A Loadstar Contest: by Walt Harned and Knees Calhoon. The ninth of a year's worth of cartoons to which *you* supply the captions.

Newsletter Naniskad: by Fender Tucker. Fender culls the best from the many newsletters he gets every month.

Napoleon: by Maurice Jones. Also known as Forty Thieves, this is a card solitaire you probably can't beat too often.

Convoy: by Floyd Kirk. You're the commander of a U-boat in this simulation of naval warfare. It comes with a color-animated instructions program.

Tower Dungeon: by Ed Nichols. Using the *Dungeon* game system from LS #167, try to save Loadstar's editor from the machinations of his evil clone.

Puzzle Page #176: by Barbara Schulak & Knees Calhoon. Four crossword puzzles and an essay on the importance of surf music to our present-day culture.

Even More MIT Problems: by Floyd Kirk. 25 new chess problems to be solved with *Mate In Two* (from LS #171.)

FileMaster: by Jeff Jones. Jeff's masterpiece of a file handler now can display IFLI files. One is included so you can see what this new graphics format is like.

Hi-Res Workstation Overlay Printer: by Andrew Martin. UnWRAP this file and you'll have a set of files *For Hi-Res Workstation*, to make a handy keyboard overlay with all of *Hi-Res Workstation's* commands on it.

Songs Of The Immigrants: by Dave Marquis. A mini-jukebox of eight songs written by immigrants to America from the old world.

Salt Of The Earth: by Walt Harned. Walt Harned's graphical slide-show is a tribute to farmers everywhere, and especially Orville Thieman, Walt's father-in-law.

Loadstar Album Annum IX: by Loadstar Artists. Twelve full-screen title screens from our glorious ninth year are presented in a mouse-driven slide show.

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LOADSTAR LETTER #65

The Loadstar Letter

The Loadstar Letter is hard-hitting and packed with news, programming info, tutorials, and laughs for every Commodore user! It's $18 for a year and $2 for back issues. Each Issue is usually 14 pages in length and has very few to **no** advertisements. It sports the writing talents of Jeff Jones, Robin Harbron and other knowledgeable Commodore veterans. Get connected and don't miss a single issue!

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A visit to the SWRAP

Chicago EXPO

by Jason Compton

Saturday, October 24 was a lovely, crisp autumn afternoon in Chicago, not too cold and very sunny. So, of course, we all scrambled like mad to get indoors to the SWRAP Commodore Expo!

They came from quite impressive distances, enduring long drives or flights to come from as far as Canada and California for the show. In all, about 100 faithful packed into the small Holiday Inn meeting room to see the sights, learn about new developments, spend a little money, and hang out with other dedicated Commodore users.

Celebrity Developers Abound

No expo can truly be complete without celebrities in attendance, and the SWRAP show was well covered. The headliner by far was Torontonian Jim Butterfield, legendary programming wizard of Commodore 8-bit machines. Maurice Randall, the man who tore apart GEOS and put it back together as Wheels, the GEOS upgrade was on hand, as were K. Dale Sidebottom, one of the best cheerleaders our platform has today, Nate Dannenberg, hardware hacker extraordinaire, and a host of online and demo scene personalities.

Fender Tucker (left) and Jim Butterfield (right) swap Commodore tales.

Mr. Butterfield was the center of attention for most of the day, having his brain picked on all manner of Commodore subjects and history. In the middle of the day he held a more formal storytelling session, sharing his insight on Commodore's origins as a calculator manufacturer and how it was not computers but digital watches that Jack Tramiel was really shooting for until market shifts and a chip surplus meant he could sell a computer without too much trouble.

The rest of the time, Maurice Randall had the assembled throng transfixed with his demonstrations of Wheels and Wheels 128, the GEOS upgrade programs. With a SuperCPU 128 and Wheels 128, Randall kept people huddled around literally for hours at a time showing them the flexibility and power of the new operating system and its enhancements. One of the particularly interesting new developments in Wheels 128 is the ease with which it can switch between 40 and 80 column graphics mode, useful for switching quickly between GEOS applications which require one or the other.

Nate Dannenberg's Power Tower.

Nate Dannenberg garnered much of the remaining attention with his homebrew 128 Tower, which he's hacked to contain a virtual shopping list of every piece of high-tech equipment a Commodore power user could want. But the tower itself was just a vehicle to show off some even more exciting developments. Dannenberg has developed ModPlay 64 and 128, programs which play Amiga music files (MOD format) using standard Commodore sound hardware or an optional digital sound add-on he designed.

But ModPlay had to compete for time with Dannenberg's newest and hottest project, the QuickCam 64 interface. In case you've missed the past two years of excitement, the QuickCam is a small round camera used primarily on PCs and Macs to take easy black and white or color video shots into the computer. Until Nate started hacking, there was no way to connect one to a C64. With some help on the software side, he now has an interface that can display live black and white video in a variety of different resolutions and styles on the Commodore screen.

In fact, one of the projects of the day was to get a new high-resolution display mode working on the camera. Mark Seelye, (better known as Burning Horizon on the demo scene) made his way down from Minneapolis to try to finish the high-res camera module, and the other hardcore programmers in attendance did their best to help out. (Unfortunately, the module didn't get fully up and running until after the show had closed.)

More than one person offered to buy the QuickCam interface, but it remains a prototype and not yet for sale.

Other Curiosities

Speaking of one-of-a-kind items, the "CMD enhanced" SX-64 got rave reviews. Randy Harris, organizer of the SWRAP show, commissioned Eric Kudzin to hack an FD-2000 and CMD hard drive into the drive bays of the portable SX-64, and he even made the necessary wiring changes to get the SuperCPU to work on the SX-64... so that was mounted on the unit, too! It was quite a sight to see so much power squeezed into the clever little portable.

Rare photo-op: three Commodore C65 prototypes.

The Commodore 65 is something of a legendary item. It was the enhanced 64 that never was, although some number of prototype units were built. These prototypes are scattered around the world, but three of them made the journey to the show! Proud owners Todd Elliott, Raymond Day, and yours truly even posed the three together for a once-in-a-lifetime photo opportunity. I set my 65 to show off the Commodore rolling demos (including some very nice high-resolution, high-color pictures) as well as to run some Commodore 64 programs in its special 3.5 Mhz speed mode.

Todd Elliott also brought along several prototype and demonstration units of various Commodore floppy drives—special FCC test units, not-for-resale experiments, and so forth.

Steve Judd's modified-for-PAL Commodore 64 showing off some hot European demos.

One of Steve Judd's several displays was a Commodore 64 modified with PAL (European) hardware, enabling it to show various demos that are incompatible with our NTSC models. Many users got their first look at some of the truly amazing effects our overseas cousins have squeezed out of the 64.

Robert Bernardo, who made the trip all the way from Fresno, gave many people their first look at the British Commodore magazines and fanzines that have sprung up over recent years. He writes for them occasionally (and had promised them a show report) so he had a few samples to show the curious.

More people!

K. Dale Sidebottom, who has also graced the pages of this magazine, gave a rollicking demonstration of the power of the Postscript printer language, using GEOS, a digital camera, and a color printer to achieve some truly beautiful output.

Loadstar's Fender Tucker was onhand as well, sharing tales and stories with all comers as well as gently pushing Loadstar at every opportunity.

Although he didn't come with much product, Centsible Software's Scott Parker was handing out catalogs left and right, and telling people about the great new software acquisitions his company has recently made.

Mark Seelye takes time out from working on a new graphics routine.

If you were interested in becoming a demo programmer, you couldn't have picked a better show to attend. In addition to Mark Seelye, demo sceners Josh Grebe (Firestalker), Robin Harbron (Macbeth) and Darren Foulds (Shroom) were in attendance.

More Software and Products!

Steve Judd, editor of Commodore Hacking magazine and one of the Renaissance Men of modern Commodore computing, showed off a number of his new programs.

JAMMON was one of the world's first SuperCPU-only programs. It is a machine language monitor designed especially for the SuperCPU, allowing a programmer to fully analyze the memory while programming SCPU applications.

BLARG is Judd's BASIC graphics extension language, with a variety of powerful graphics commands as well as SuperCPU optimization—although any machine can use and benefit from the BLARG commands.

Tunesmith is his contribution to Commodore music makers. It includes a powerful song editor, instrument creator, even a built-in programming language for complex effects and songs.

VIC-20
SARGON II CHESS
JUPITER
PINBALL SPECTACULAR
Lots of goods were on sale—even for the VIC-20!

If you were looking for some new or used products for your Commodore, there were vendors on hand to take care of you. Some indivduals were selling portions of their collection—the odd software title, or an occasional drive. Others had more professional displays. Although not many computers were sold, a ton of games, cartridges, magazines, cables, and monitors could be had at the show. In addition, the club was selling high-end CMD products like SuperCPUs and RamLinks. My favorite product of the day: floppy drive cables that were 25 feet long if they were an inch.

Show Post-Mortem

There were an awful lot of smiles at the show. 100 people may not sound like very much, but when it's 100 people who are happy to be in the company of new friends who share common interests, it suddenly seems like a lot more. That, and the small room.

The club had a lot of new CMD products for sale.

In all seriousness, the show could only be considered a great success for the users. Everybody got to see some things they'd never seen before and meet someone they'd never met before. While the guy in the back of the room with the three-dozen or so monitors didn't sell as many as he would have liked, a number of people were in the buying mood and helped spread the wealth around.

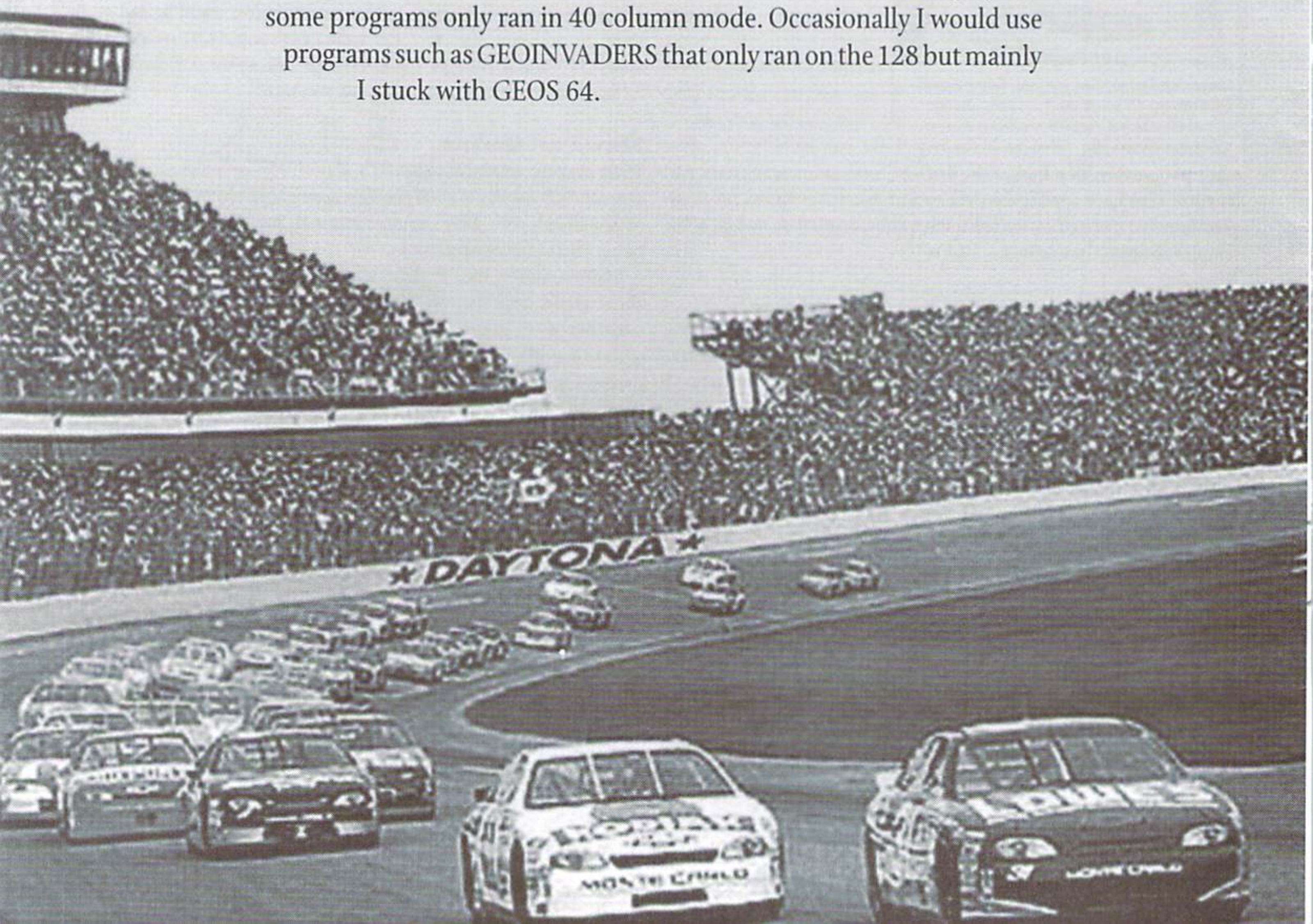
A more organized presentation schedule would have been nice: through nobody's fault in particular, the Wheels 128 demo turned into more or less an all-day event and probably hurt the impact the day's other presentations had. Yet, in view of the 'bigger picture', it's more important to get together and support one another. Shows like the SWRAP expo do a fine job of this, and they're proof that if you build it, they will indeed come.

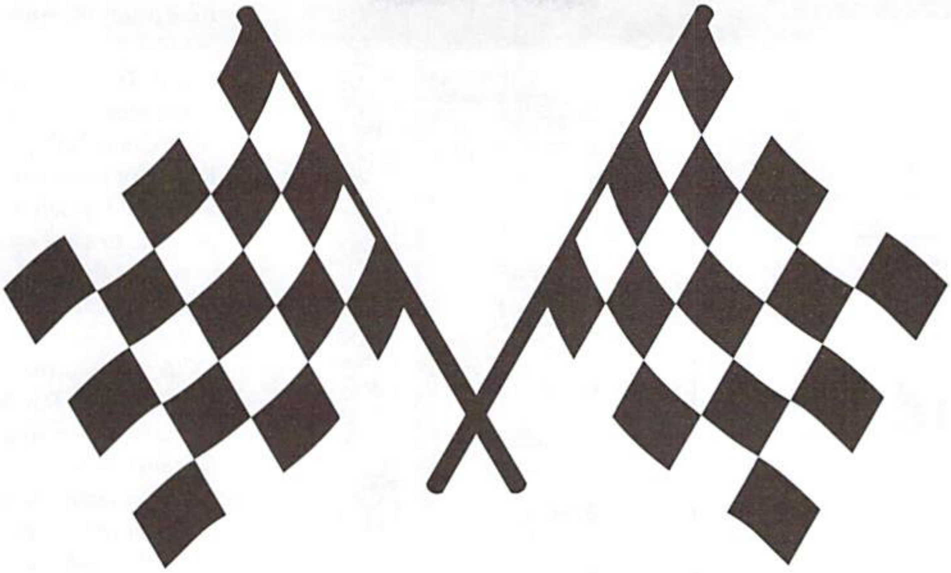
Wheels 128

GUI DRIVING POWER

by Bruce Thomas

I'll admit right here and now that I have not been a regular user of GEOS 128. I've owned a 128D for 4 years now and got GEOS 128 V2.0 shortly after getting the machine. Of course, I liked the 80 column display but some programs only ran in 40 column mode. Occasionally I would use programs such as GEOINVADERS that only ran on the 128 but mainly I stuck with GEOS 64.





A big reason for this was the fact that I owned a TurboMaster Accelerator that propelled GEOS 64 at 4 MHz—up to four times as fast as the 128 could go. Considering that I work with geoPublish a lot, a 40 column program, the speed increase (very important when using a Graphical User Interface—GUI) far outweighed any advantages that GEOS 128 offered. Once I could run my 64 at 20 MHz the 128 didn't stand a chance.

With the release of Wheels 128 Maurice Randall has brought the 128 up to speed, so to speak, as far as hardware handling in a GUI is concerned. Not only does the new system provide full access to all of our hardware it is also a unique time machine offering a glimpse into the future for Wheels 64 owners. While this article will deal with what is new in Wheels 128 V4.1 all of these new features will show up in the V4.1 release of Wheels 64 so read on.

Kick The Tires

Numerous improvements are immediately apparent in Wheels 128. As you give it this first look over keep in mind that GEOS V2.0 is no longer a requirement. You can upgrade to Wheels 128 from GEOS 128 V1.4 if you want to but V2.0 comes with vastly improved major applications so you should have it to get the most GUI satisfaction.

This package arrived with a new, unified 56 page manual (plus index and appendix) that covers both Wheels 64 and Wheels 128 in an easy to read 2 column format. Differences between the systems are noted where appropriate.

Start Your Engine

Wheels 128 is a self-contained system. This means that the disk you receive is now bootable and will become your original Wheels 128 Master Disk. Your original GEOS disk is requested at the appropriate time to register the serial number only.

The install process is straight-forward and simple. Since you are booting Wheels, all of your RAM and hardware can be plugged in and active. A very thorough 4-page installation guide takes you through the entire process. Inspired, I am sure, by the infamous GEOS 128 install process it is possible to write-protect your disk and do a practice install.

As Wheels boots for the first time you must enter the type of system RAM to use, the input driver to install, the clock source to use, your name and your original GEOS disk when required. The Wheels disk comes as either a 1581 or 1541 disk with prompts for sides 1 and 2 during the 1541 install. The final part of the install tells you to write-protect this original disk. After your install has successfully completed you should run MakeSysDisk to create backup Master and Boot disks. Again, the system works smoothly and is as fool-proof as it can be. After creating a Boot disk, copy at least one input driver and printer driver to it before use. Without an input driver the system defaults to a 1351 mouse driver in port 1; we'll talk about printer drivers later.

The first time you boot with your newly created disk the experience will be similar to the initial install. This time, however, the default hardware information (RAM, Input Driver, Printer, Clock) will be saved to your disk. The dialog boxes for these items will only show up again if you change your RAM hardware, create a new boot disk or use a special key combination during bootup.

Things That Make You Go

The ToolBox is run invisibly during the boot process to install the proper drivers for the devices on your system. The dialog boxes where you set the type of RAM, boot settings, input and printer drivers, and clock source are part of the Toolbox. One new boot choice is the port (1 or 2) you wish to use your mouse device in—slick!

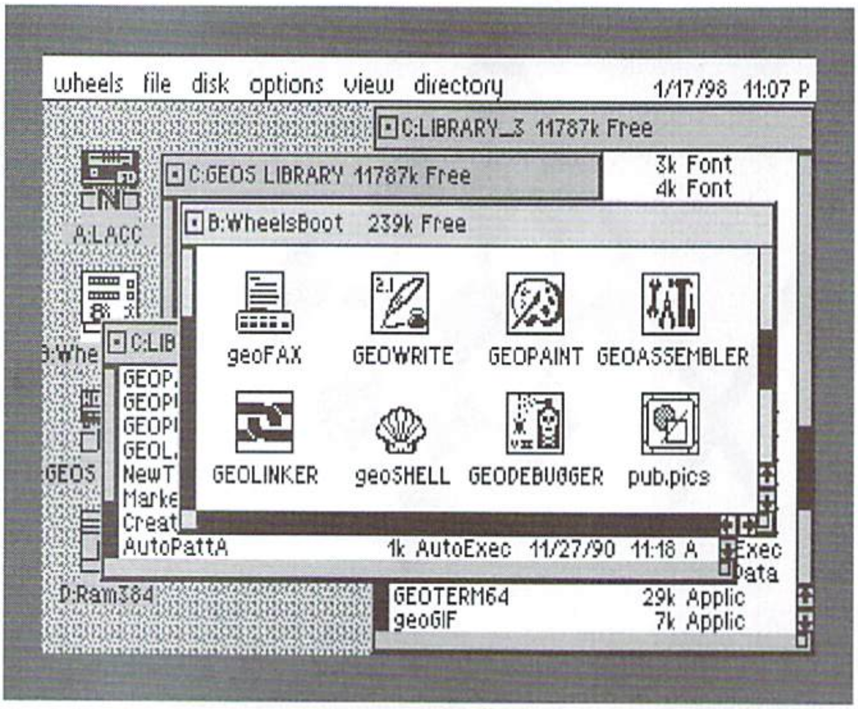
When you run the ToolBox a user interface appears showing the drives currently installed and running on your system. Drives A through D are listed in separate boxes containing the device, the type of driver in use and even the active partition number if appropriate. By clicking on one of the four boxes in the top half of the screen (Current Config) it is possible to add or remove

Wheels 64 & 128 Update

After this article was submitted, Maurice Randall released yet another update to both the Wheels 64 and Wheels 128 operating systems. Initially, Wheels 128 received a number of bug fixes, including some for various drivers. In addition, a rewritten window resize function that insures that all files can be seen in icon mode after making the window smaller, and a new option for selecting American or German keyboard and character set in the installer.(Maurice is also presently looking for information on keyboard layouts and character sets for France, Holland, Italy, Switzerland, Spain, Portugal, Finland, UK, Norway, Denmark and Sweden.

These fixes, plus all other new features found in Wheels 128 (with the exception of features which will only work on a C128) were then added to Wheels 64, bringing that variation of the operating system up to the same revision level.

Maurice Randall has begun shipping a free upgrade to this version to all registered owners of Wheels 64 and Wheels 128. The upgrade does not include a new manual, but this may be purchased from Maurice.



drives, format and validate disks and change partitions. An option to SAVE the chosen device to the bootup configuration is also available.

This application also offers options for SuperCPU optimization and it provides a complete breakdown of your RAM usage. This makes it a more than capable replacement for the myriad of Configure files that were previously required to run our hardware under GEOS.

Polish the Chrome

The DetailShop is where you can customize your Wheels. It is here that the screen, application and system colors can be set—for both 40- and 80-column modes (80-column color works here whether you have 64K VDC RAM or only 16K). Here too you can adjust your background pattern and tweak your mouse performance.

Have you tried any of the GEOS screen-savers? Some of them are pretty cool with fancy wipes and fadeout effects. Some of them are auto-execs and some allow you to control the time delay. Most of them don't work.

The ScreenSaver in Wheels, also found in the DetailShop, leaves all of the rest in its dust. No, it doesn't wipe or fade or dribble down your screen. What it does do is perform.

Options let you choose the time delay and also the deactivation method. This is the best feature. My mouse, and a lot of others I presume, causes the pointer to jump a bit on the screen if it isn't sitting properly. The Wheels ScreenSaver ignores the mouse jitters (the downfall of other screensavers) and blanks the screen anyway. A keypress or mouse button push brings back your screen display. To me, the fact that it always works makes up for the lack of frills.

No Fuzzy Dice, Please

This Dashboard is clean. The screen looks identical in 40 and 80 column modes except for the menu/clock font, the mouse pointer and the lack of color in 80 column mode if you only have 16K Video RAM. The drive icons are lined up on the left side. A printer icon may appear in the lower right corner. The clock and menu appear across the top. All in all there is a nicely balanced look to the Dashboard but the icons can be placed wherever the user wants.

The initial Dashboard screen opens with no drive windows visible. Once you double-click on a drive icon you will be presented with a lot of information about that disk.

The drive letter, disk name and KBytes Free appear across the top of the window. A fuel gauge down the left side provides a graphical representation of the used/free space. A scrollbar and two control arrows adorn the right side of the window providing a quick method to move through the directory plus a graphical view of the number of files on the disk. A box in the upper left is used to close the window while one in the lower right is used to resize the window.

Color is used to indicate active windows as well as different types of windows. Since 80 column color is only fully supported on 128's with 64KB of Video RAM a few other indicators have been added. The top left Close box is filled solid if the window contains a main directory (default color Cyan). If the window contains a System Directory (more on that later—default color Red) the top left box will be hollow. It is possible to have up to 16 windows open at once so a thin line appears below the Close box to indicate the active window.

A great new feature of the Dashboard is the ability to swap drives. While it is possible to work from Drive C or D with our present applications we can't use all four drives. If you find you absolutely must have your D drive moved to the B drive position you can do that. Pick up a ghost of D and drop it on the B drive icon the same way we have always swapped drives in GEOS. A dialog box will ask if you want to copy the drive or swap the positions. Simple.

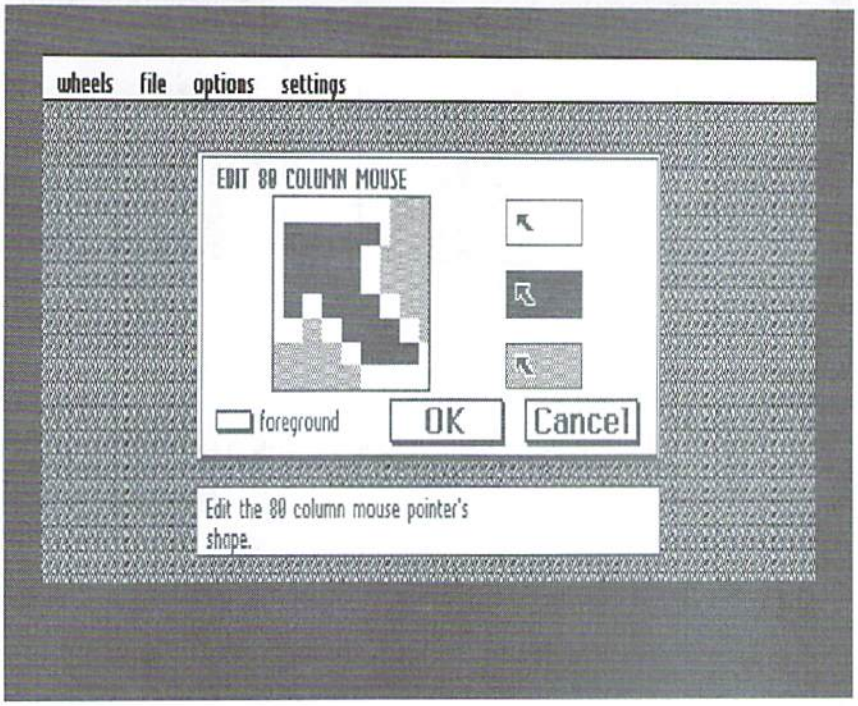
A new twist has been added to the Wheels swap. As an example it is possible to boot Wheels with only devices 8 and 11 active and they will come up as Drives A and D. If you want only a 2 drive system you will need to have them as A and B. Click on Drive D and then choose the SWAP option under the DISK menu. A Dialog box will allow you to choose which drive to swap with - even one that doesn't exist (like B in this case). Swapping drives automatically adjusts any open windows for that drive also.

There's a Desk Accessory (DA) option under the Wheels menu which opens a dialog box that allows you to run a DA from any drive on your system (and don't forget the DA Color setting under the Option menu). As with any such dialog box in Wheels, when you see a DISK icon while accessing a partitionable device, you can access other partitions as well. This feature is really nice while working within the DashBoard environment; what we need now is an actual D.A. version so we can use it in our applications (Jim Collette's DA Runner only supports 3 drives and seemed to have difficulties with the new DISK icon).

Cruise Control

The System Directory (sysdir) mentioned earlier is a very handy item. In GEOS it was possible to move file icons off the desktop notepad into the lower border area. The Wheels sysdir is like the border area on steroids.

The sysdir can hold far more than the 8 files the border area could. Any files stored in the sysdir are considered to be a part of the root directory of the drive and, if you use native partitions, any subdirectories that are linked to the root sysdir. Each subdir can also be configured to use its own



Edit the 80 column mouse pointer's shape.

sysdir instead of the root sysdir but any directory can be linked to only one sysdir. It is easier than it sounds.

The sysdir allows you to save a lot of disk space. By placing the Applications, Fonts and Desk Accessories that you want to use for a project into the sysdir you can access these files from any directory linked to that sysdir. This lets you organize projects in individual subdirectories while only requiring one copy of the application.

You can also save space on your boot disk as Wheels eliminates the need for many of the auto-execs we depended on for things like the screensaver and setting the time. One other retiree is CENTER 80. The GEOS 128 screen wasn't properly centered vertically on the screen without this file on your boot disk whereas Wheels handles the screen properly.

Do you want an easy shortcut to geoWrite or any other application? The inclusion of the geoShell item under the Wheels menu may seem frivolous if you don't own geoShell, but it can be used to your advantage. By renaming your favorite application "geoSHELL" it will be found and loaded from anywhere on your system by choosing this menu option.

The addition of the Printer Icon is a welcome touch. Not only does this display the name of the driver presently installed it also provides an easy method to change printer drivers. By double-clicking on the icon a Dialog box comes up listing all printer drivers on the current disk. Since the printer driver is kept in memory at all times it is possible to select one from any active storage device using the Drive and/or Disk buttons.

Speed Bumps

Not all of the software I tried with Wheels 128 worked. Two programs that definitely did not were MahJongVDC and VDC Solitaire. While the 40 column color versions run as expected these two modified editions do not. Other 80 column color games like GeoInvaders and Decode! worked fine.

GeoLogger, one of my favorite cataloging programs, has trouble but that is understandable. All of the new drive types that are available under Wheels did not exist when geoLogger was written.

Wheels is a point and click interface, but it also has numerous keyboard shortcuts. Sadly, my own favorite GEOS 128 shortcuts—accessing the menus with the cursor keys—aren't here. If you learn the shortcuts you can get things done quicker (with no trash can at least remember <Commodore><E> to Erase files) but you may find you are always forced back to your mouse/joystick at some point. Using shortcuts I can change the active drive and summon the Dialog Box to change partitions but I can't choose the partition I want from the keyboard.

While I like the fact that I can change my current printer driver by double-clicking on the icon I'm not totally thrilled with the process of setting a default. During the initial boot process the presence of a printer driver will cause a dialog box to prompt you to set this as the default. Answering Yes will do that. Answering No will cycle to the next driver with the same prompt. Your third choice is Cancel and I suggest you choose it (press 'C').

By cancelling the installation of a default printer driver your Wheels system acts more like GEOS. Changing printer drivers is then as easy as making the new one the first driver on the disk and it will install the next time you boot Wheels. The Set Printer option under the Dashboard Wheels menu only changes the driver used during the current session. To change a default printer driver (if you answered Yes above) you must enter the ToolBox by holding the Commodore key and Left Shift key while booting Wheels.

Another minor inconvenience involves resizing a drive Window. It is possible to set the window size so that the top icons are visible but only a portion of the bottom icons show up (i.e., you have 14 files on the disk and resize to show three rows of four icons and the tops of the last two icons). In a situation like this the down-arrow won't scroll the window to make the bottom two icons completely visible. Click in the space above the arrows but below the scrollbar and the window will move down. After scrolling back to the top of the directory the down-arrow will work fine.

No Horizontal scroll arrows are present so if you make the window narroweryou won't see all of the files. In this case it is best to choose Text mode for the window and you'll see the names of all of the files along its left edge.

These are minor problems and most have easy ways to get around them. They will only be an irritant if you don't use all of the tools the system provides. Besides, no set of Wheels is totally perfect for everybody.

Dependable Service

Maurice Randall guarantees 100% installation satisfaction—including a free Wheels disk replacement within 30 days if your master disk should go bad (no matter what the cause). Here's another indication of his commitment: After receiving the initial version of Wheels 128 some users had serial number problems. As soon as he heard of this, Maurice created a patch and sent it out to those whose disks had already been shipped. I received the patch via Email 5 days before the snail brought my Wheels 128 disk.

The arrival of Wheels 128 is an important move forward for GEOS 128 lovers. Even casual users like myself (although that has now changed) will appreciate the speed and freedom that Wheels provides. If you're serious about driving your Commodore, you'll find these Wheels essential when things get GUI.

Just For Starters

by Jason Compton

DISK & FILE COPYING

You can never have enough floppy disks. Sooner or later, you're going to run out of space somewhere, or need an extra disk, or want to make a backup copy of an important program or document. Half of the equation is making sure you have enough storage space on hand. The other half is actually copying the data from one disk to another. That's what we'll try to clear up this month.

Storage Space

The most basic unit of disk storage on the Commodore is a plain old 1541 floppy drive, accepting 5.25" disks. Each side of a 1541-formatted disk stores about 170K of data. You can move up to greater storage capacity on drives such as the 1581, FD-2000, or a hard drive, but for now we'll focus on copying from a standard 1541 on device #8, the basic configuration for the vast majority of us.

Some people like to use "work disks" that they use to save all of their recent projects on—one disk for all the latest graphics creations, another disk for all the latest BASIC programs, and so forth. The trouble with work disks is that they can fill up quickly with redundant old projects. You can erase them, but what if they're still important enough to keep around even if they're no longer relevant enough to be on a frequently-used disk? That's where copying to a backup disk comes in very handy.

BASIC Copying

The most simple and straightforward way to copy a file from one disk to another is to LOAD it and then SAVE it in BASIC. There's a major catch, however: the file you're copying must be a BASIC program. So, if you've just written a BASIC program to print "Hello World" all over the screen in all sorts of colors, and want to copy it to a friend's disk, this will certainly work:

```
LOAD"HELLO WORLD",8
```

<remove your disk, insert your friend's disk>

```
SAVE"HELLO WORLD",8
```

Nothing to it, right? It's a fine way to make a single copy of a BASIC program. If you have another disk drive, you can substitute its number (9, 10, etc) for the 8 in the SAVE process. But you can't copy any other file this way: no graphics, no machine-language programs, no letters or documents, nothing.

We need to use external programs to do more complex copying, such as non-BASIC programs, multiple files at once, or even entire disks at a time.

Copying Files

Almost everyone should have a rudimentary file copying program: UNICOPY comes on many of the Commodore Test Disks issued with every disk drive. With UNICOPY, you can copy files of any type from one drive to another. But UNICOPY is old, clunky, and requires that you have two disk drives. There are certainly more convenient options out there.

Literally hundreds of copy programs have been written during the Commodore's 17 year history. Cataloguing all of them would be a waste—it is enough to know that if you look hard enough, you'll find them. Instead, we'll give you an idea of what sorts of programs are easiest to find, and how the different major types of copy programs tend to work.

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disk, which contains a useful program called FCOPY. (You can also buy an enhanced version, FCOPY+, as part of the stand-alone CMD Utilities disk.) FCOPY allows you to select any number of files from a directory list of one disk and copy them to another. It is reasonably easy and painless to use, but it still suffers from the restriction of requiring more than one drive.

If you don't have FCOPY but you do have JiffyDOS, you have a built-in drive-to-drive copy program. Using the X (*set destination drive*) and * (*copy file*) JiffyDOS commands, you can do file copying between two different drives. The drives do not both need to have JiffyDOS installed, although it does result in a faster copy.

But if you don't have two drives, fear not. A number of other programs allow you to copy files from one disk to another even if you only have a single disk drive. The down side is that, for large files, you may have to "swap" disks: re-inserting the source and destination disks as the file copies progress. That's because when you only have one disk drive, the computer has to serve as a buffer.

A buffer, in general computer terms, is an area of memory used as a temporary storage place for a given amount of data. In this case, the Commodore's available memory is used as the temporary storage for files read off of a source disk, so that the source disk can be removed and replaced by a destination disk. The computer copies the buffer out to the destination disk.

Let's say you're copying 150K of files (that's about 600 blocks) from one 1541 disk to another. You go through the interface of that particular program to select the files you want copied—some present you with a list you scroll through with cursor keys and you "flag" the files you want copied, others present you with each file one at a time and you answer "Yes, copy" or "No, don't copy" until the list is done.

150K is more information than can be stored in the memory buffer at one time, so the process will require multiple *passes* (a pass, in copy terms, is one read session from the source disk and one write session to the destination). A typical file copy program will read from the source disk, prompt you to replace the source with the destination disk, write for a time, ask for the source disk back, and so forth until it finishes the job.

By contrast, copy programs which use two drives do not require you to change disks, since the data read into the buffer from one drive (the *source* drive) can be immediately written to the disk in the second (*destination*) drive. Some two-drive copiers take this one step further, and eliminate the need for a buffer in the computer by sending data directly from the source drive to the destination drive. While this can speed up the copy process, it is less common with file copiers since they may need to keep track of a lot of individual files.

Many utility cartridges (Super Snapshot, Action Replay, Fastload, etc.) also come with built-in file copiers that are at least adequate for copying files on a single-drive system. Most commercial copy programs, such as Maverick, also have efficient file copy utilities for one or more drives.

Beyond Just File Copying

Here's where things start to get trickier. Now we understand how to move files from one disk to another and that, unless they're BASIC programs, we can't do it using the familiar LOAD and SAVE in BASIC. But the trick is this: Not all information you may want to back up is always stored in a file you can see!

Particularly with commercial software (and games in particular), often there is data on a disk that does not appear as a file in the directory at all. You can't LOAD it in BASIC, and a file-by-file copy program will fail to see it. That's when you need a whole-disk copy program. A whole-disk copy program copies every single piece of data, whether or not it appears to be connected to a file or not, from one disk to another. That way, you get an identical copy.

The most straightforward sort of whole-disk copy program simply takes all of the data from one disk and places it on another. Because of the size of disks (remember, a 1541 disk, the smallest available, is 170K!), a whole-disk copier could need four or more passes (source/destination disk swaps) using just a single disk drive. With two drives of the same type, the process tends to be automatic, just as it is for file copies.

Here's another catch: copy protection. It's on all sorts of commercial software, game and productivity alike. If you're trying to make backups (whole-disk copies) of these disks, a special sort of disk copier, commonly known as a "nibbler", is needed. With plain whole-disk copiers, a copy-protected disk will give it fits—either errors during the copy process, or a resulting copy that just doesn't work.

A nibbler can, in many cases, successfully copy protected disks. However, nibblers typically do not *remove* copy protection—that's important to understand. The resulting backup is usually just as copy-protected as the original. Think of a nibbler as a way to sidestep copy protection, not eliminate it.

Whole-disk copiers can also be used for a special purpose: to transfer an entire disk, like a 1541, onto a similarly partitioned area of a disk like an FD-2000, RAMLink, or HD. CMD's MCOPY can accomplish this feat, or can be used as a basic whole-disk copier between two standard floppy drives.

Other whole-disk copiers can sometimes be found on utility cartridges, such as those listed above, or in copy program packages.

One of the most popular copy programs (and not entirely coincidentally, one of the few still readily available) is Maverick. Maverick has one of the most powerful nibblers ever created, as well. It also provides one additional feature that can help out with copy-protection: parameters. As used by a copier like Maverick, parameters tell the copier how to copy a specific program disk, making sure that any special things that need to be done to duplicate (or in some cases remove) the copy-protection are taken care of.

File Management

It's more important than you think. Keeping your work or project disks organized, and scrupulous backups in a safe place, can save you a lot of heartache down the road. Unless you have a photographic memory, locating the disk that has your latest resume can be troubling unless you've got it on a disk you know how to find—and you'll find it much better if you copy files onto disks that you can readily label as "letters", "job stuff", and so forth.

It's also worth pointing out that magnetic media is not immortal: disks can fail as they age, and some of our disks are nearing the two-decade mark. Buying a fresh box of floppies and making some backups is a good idea.

A safety tip: It's always a good idea to write-protect your source disk. Those little tabs that go over the disk notches can be lifesavers if you accidentally forget what you're doing in the middle of a copy process. If you don't have the special little tabs, a scrap of electrical tape does the job just fine. (Scotch tape doesn't work, because the sensor is an electric eye!)

If all of this sounds too much, don't worry. Find a copy program, get a few blank, formatted disks to use to test with, and just learn by doing. Most of them are easy to understand once you take a look at them, and if you've got a write-protect tab on your source disk, nothing can go wrong! In no time, you'll be churning out all those important backups and meticulously arranged archival disks.

Jason Compton is a freelance writer and Editor of Amiga Report, the online news resource for Commodore Amiga users. Jason can be contacted via Email at jason@cmdweb.com.

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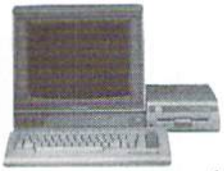

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Graphic Interpretation

by Bruce Thomas

TO CMD OR NOT TO CMD

A short time ago there was a thread in the comp.sys.cbm newsgroup on the Internet that slammed CMD and this very magazine. At first I found these comments a little hard to swallow but then realized that the person had a point, albeit a misguided one in my mind.

The person thought Commodore World Magazine was nothing more than a thinly veiled advertisement for CMD products. In an effort to show that writers do listen to their readers I shall try to get through this column without mentioning CMD or any of their terrific products—oops, too late.

Now, at this stage in the life of Commodore computers, when there aren't many manufacturers or developers around anymore, we should be grateful that CMD is still in this market supporting us. Hell, they don't just support us, they have given us more life than Commodore ever did. By creating such wonderful enhancements to our computing environment as RAMLink, HD-series Hard Drives and FD-series Floppy Drives, SmartMouse, 20 MHz SuperCPU Accelerators and JiffyDOS, CMD has greatly extended the useful lives of our computers.

On top of their originality they have also saved, and in some cases improved upon, products that otherwise would have disappeared totally from the market. These items include such things as the SID Symphony cartridge, SwiftLink (now Turbo232), RAM Expansion units (with original Commodore REC chip), geoCable (now geoCable II) plus many software titles including the entire GEOS family of products. Ads for all of these items appear in this magazine.

Looking at things from this perspective it is easy to see how the person could think that this publication is a self-serving product for CMD. Tough not to promote yourself when there are no competitors for the majority of the products that one produces. Nevertheless, there are ads between the covers for a variety of other Commodore-related businesses—support them or they may disappear.

Impartiality

OK Bruce, get down off your soapbox. This column is supposed to be about GEOS. Of course, since CMD is the supplier of GEOS, and almost every major commercial add-on product, I felt I had a tough job trying to fill space without promoting CMD and their products.

So what am I going to do about this situation? I thought about the problem, looked through the CMD product catalog, and realized that there is still a lot of GEOS software that CMD doesn't carry. I went back to old GeoWorld magazine issues and found addresses. After my searching I wrote letters. When some of these came back I searched the Internet for updated snail-mail and Email addresses.

What I found out is that some of the authors of some great GEOS programs still offer their products for sale. Some of the

"In an effort to show that writers do listen to their readers I shall try to get through this column without mentioning CMD or any of their terrific products—oops, too late."

authors replied that they no longer had any Commodore equipment and released their software to the Public Domain. Some didn't reply at all but did offer products at one time that would still prove very useful—maybe they need to hear it from more than just one writer from Canada.

Sources

Tom Adams (tom.adams@sysnet.net), President of Meeting 64/128 Users Through the Mail Users Group (a great resource if you don't have a local group), has offered to make copies of Spike Dethman's GEOS Disk 1 for the reasonable price of U.S. $2, postage included. Spike no longer supports the Commodore but don't let that stop you from sending him the $10 shareware fee he asked for. Two programs on this disk that I find indispensable are geoPack (great for transferring GEOS files) and Paint Rotate (excellent geoPaint utility) plus there are input drivers and many other useful programs. Read more about it in Commodore World Issue 8 (oops).

What makes GEOS so great is the integration of the system. A graphic made in geoPaint can be inserted into a geoPublish document. A geoFile database entry can be printed on a label by geoLabel. Text from geoWrite can be added to a geoCalc spreadsheet and on and on. To be able to have more than one text or photo scrap you must use albums. Of course, an album set up for one project might not be good for the next. To move scraps from one album to another you need a utility. Rick Coleman wrote Photo Mover and Text Mover to handle just such jobs. The disk (U.S. $15) comes with a number of photo albums and versions of both programs for 40 and 80 column screens. Read the review in Commodore World #5 (oops).

The Software Guild is a company run by Roger Lawhorn. Roger wrote such great GEOS programs as geoLabel (the BEST GEOS label-making program), geoPrint (cards, banners, signs, etc.), SuperBOX (64/128 versions to see more than 15 files in Dialog Box), plus many other programs. All of the programs, plus some previously unreleased software, are available for $30 which includes two 1581 disks and all of the source code in case you want to learn some GEOS programming. For more info visit the web site (http://members.iglou.com/luckykds/tsg.c64).

Jean Major no longer owns a Commodore and released his work into the Public Domain. Jean's DBGETFILES was a popular GEOS fix for the 15 file limit in dialog boxes. Other programs he wrote include EggTimer (count down hours and minutes), patches for several applications, a 1581 bootmaker, a screen shot Desk Accessory and an Icon Grabber to name a few. A number of geoPacked files (get Spike's disk) containing Jean's work can be found on the CMD web site (oops).

At one time Paul Murdaugh offered patches for GEOS applications so they would work with 4 drives. While I had no use for this service at the time the arrival of Wheels has changed that. I have not received any response from my letter to Paul so doubt he still offers this service. Markus Kanet, author of the forthcoming MP3 GEOS upgrade told me of a patch in the works for four drive support in German GEOS applications. Once the German patch is done an attempt to create patches for American versions will be made—watch for this to fill the void Paul has left (unless you can find Paul).

Resources

Spike Dethman Disk
c/o Tom Adams
4427-39 St.
Brentwood MD 20722-1022

Photo Mover V3.0:
Rick Coleman
P.O. Box 44
Sheridan WY 82801

Roger Lawhorn
The Software Guild
1723 Greentree Blvd, Apt #25
Clarksville IN 47129

Joe Buckley
c/o Storm Systems
464 Beale Street
W. Quincy, MA 02169

Joe Buckley recently gave Dale Sidebottom permission to include his Wrong Is Write (WiW) on the Laser Lover's Disk. At the time, Joe told Dale that his Storm Disk 1 is still available for $20 but Joe hasn't answered my mail. In addition to WiW the Storm Disk contains REU ZAP II (makes loading an REU quick and easy), Graphic Storm II (convert many graphics formats into GEOS), Album Reverter (in case you only have photo manager V1.0), some fonts and font utilities, various boot disk maker programs and two versions of the GEOS game CIRCE (see Commodore World #18—oops!). The 1541 disk is packed on both sides.

Randy Winchester was a strong presence in the Commodore community years ago writing the AntiGrav Toolkit column in GeoWorld, creating the KeyDOS ROM and pioneering PostScript printing. Randy also wrote a lot of good GEOS utilities and some fun programs on two disks: Randy's GeoDisk 1 (64) and Randy's GeoDisk II (64 and 128). The files are all on his web site (http://web.mit.edu/randy/www/antigrav/antigrav.html) as are his geoWorld articles.

Anyhow, there you have it. A column that, hopefully, isn't just more promotion for all of the great products that CMD offers. Until next time, enGEOy your Commodore.

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SOFTWARE IN REVIEW

GoDot

IMAGE PROCESSING SOFTWARE FOR THE MASSES

GoDot; US$34.95; Authors: Arndt Dettke and Wolfgang Kling.

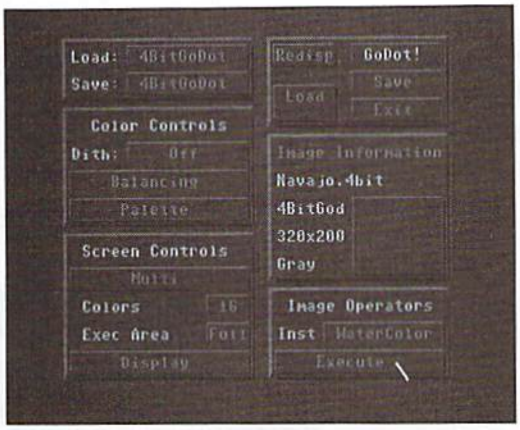
You may never have thought about it in these terms, but computer graphics have evolved like everything else. From stick figures to high-resolution, full color, 3D displays, computer graphics have come a long way.

So has the way people think about creating graphics. In the beginning, it was considered enough to draw lines: connect point A to point B. Then, people began to think about how nice it would be to draw more than just lines—they wanted shapes and colors, and greater flexibility in putting them together. Some of the world's great paint programs were born. On the 64, you might use GeoPaint, Blazing Paddles, Advanced Art Studio, iPaint, or any one of dozens more.

And as these paint programs were perfected, people began to look at their work. It was good, but perhaps a clever shading effect was needed. Maybe it was too bright or too dark. Maybe they wanted to do some radical special effects that their paint programs didn't allow. That is how the image processor was born: to do the special effects that paint programs often lack.

GoDot is an image processor for the 64. There are no brushes, circle tools, or erasers. Instead, GoDot offers a large array of image processing effects (called "modules" in the program.) You can load images from a variety of popular formats, including the Amiga's IFF and the PC's GIF and PCX formats. Your work can be saved to most of these formats, although GoDot does not have a GIF saver.

GoDot borrowed heavily from image processors on other platforms, so some elements of the design may be familiar. GoDot's main screen controls much of the program, but many modules have their own settings. You'll spend a great deal of your time working with the "Image Operator" settings, because that's how you select which module you want to use—that is, which effect you want to apply to your work image. Some modules are also used to control system settings, or even to play games or run a screen saver!



Load: 4BitGoDot
Save: 4BitGoDot
Dith: Off
Colors 16
Exec Area Full
Navajo.4bit
4BitGod
320x200
Gray
Inst WaterColor

GoDot's modular point and click user interface.

Image processing is also different from painting in that you do not get results immediately, in real time. Instead, an effect can take several seconds, sometimes a minute or more to complete. When it is done, you *render* the resulting picture to the screen to inspect it, and rendering to the screen in GoDot also takes considerable time. Image processing requires planning and patience, although it is easy to get started.

GoDot Basics

First, you select what sort of image you're going to load in the Loader module section. Then, you actually load the image into memory. You can view a thumbnail in the middle-right of the main screen, or render the entire image out (in either 320x200 hires or 160x200 multicolor modes) if you want to verify what your image looks like in GoDot. Next, select what effect to apply in the Image Operators area. Click Execute, and GoDot is on the case. A vertical line passes through the thumbnail area to indicate progress in processing your effect.

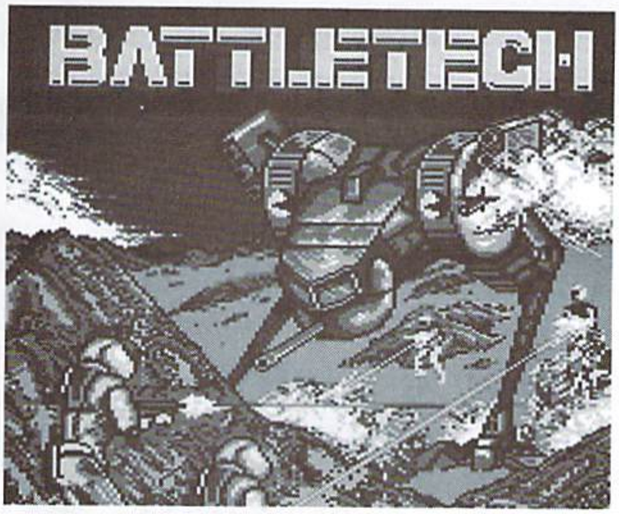
When that's finished, you re-display your image. If you like the results, you can apply more effects, or save the results. That's all!

Of course, that's not really all. Not all effects are really appropriate for an entire image. Perhaps only a certain area should get that airbrush effect you're looking for. In that case, you first use GoDot's "ClipWorks" module to define the area you will work with, instruct GoDot to only consider that area when applying your effect, and then apply the actual effect module to the image.

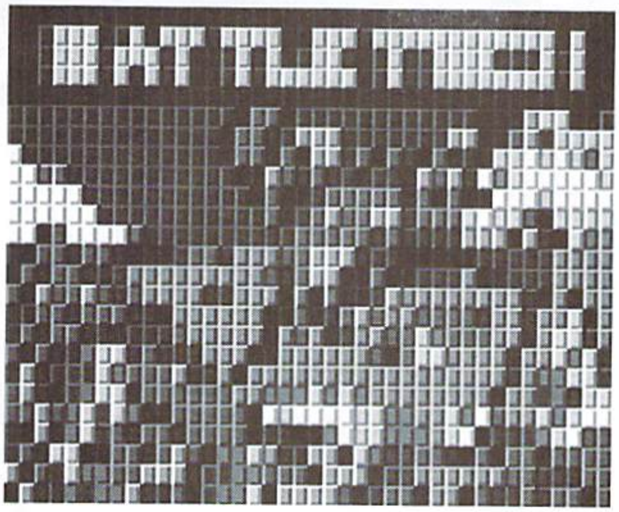
GoDot's rendering engine is quite powerful. Not only can it display any image as either hi-res or multicolor and in any color depth from 2 to 16, but it has palette swapping (assigning one color to replace another in your image) and easy to use balance and contrast controls to adjust the levels. Balance and contrast, when used carefully, can really achieve some dramatic results in a picture, and the best part about them is that they don't take any extra time to do their work. (You do need to re-render the image after you change the balance or contrast, however.)

GoDot In Practice

In practice, I found GoDot a pleasant surprise. I was able to bring pictures over from other platforms and load them right into GoDot, although if they started in a larger size or with substantially more colors, they often required



The Battletech screen image (left) was processed through Godot's mosaic module (right).



some tweaking before they looked "right." GoDot sample images, and images you import from other 64 programs, will of course be easier to get started with immediately.

I found the array of modules to be pretty impressive. You can perform a variety of the same kinds of effects expensive programs on other platforms do, and since GoDot is easy to expand, we can only hope that more will be on their way.

However, I should make a very important point. I enjoyed using GoDot, but I have a SuperCPU and an REU, as well as three disk drives. I would have to say that to truly get good use from GoDot, you should consider a two-floppy system and some form of high-speed disk access an absolute minimum, with a SuperCPU and an REU highly advisable. It would also be a good idea if at least one of those floppy drives had higher storage than a standard 1541 (a 1571 in two-sided mode, a 1581, an FD, an HD, a RAMLink, SOMETHING.)

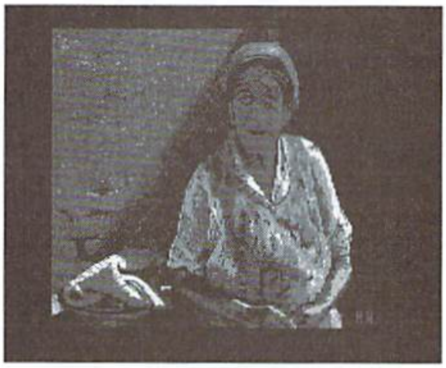
With only one floppy drive, you will find yourself flipping disks like mad to get to all of the modules you want to use, as well as get to your work disk to save your progress. As for the SuperCPU, it will greatly assist with rendering and apply effects. Hires pictures can literally take a minute or more to display to the screen, and some of the more complicated effects, like Motion Blur, can take several minutes on a stock 64. As for the REU, it can be used as storage for render, loading, and saving modules, as well as for undo. Presently, GoDot can address up to 1.5 megs of REU memory.

One caveat on the SuperCPU: although it is fully compatible, there is a problem with the joystick routine that can cause "extra clicks" that can be inconvenient while making selections in GoDot. You can get around the problem by switching Turbo off when in the interface and turning it back on for rendering and applying effects, but this is certainly unappealing and unfortunate.

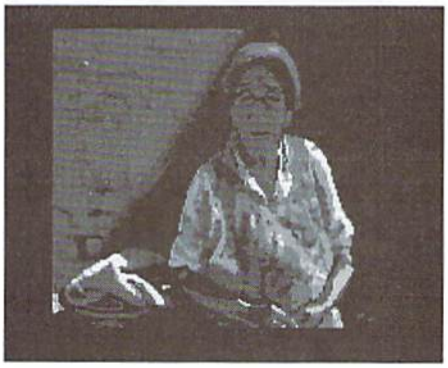
The documentation of GoDot is not as long as I would have liked, but it does have some very useful tutorials. You should set aside some time to work with them to get a true feel for the program and how image processing works.

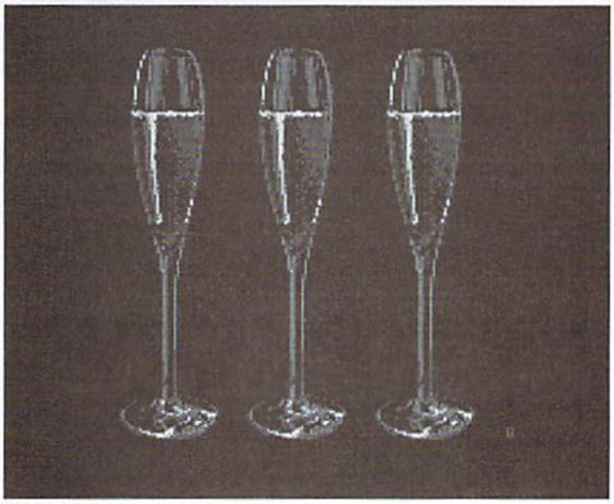
At $35, GoDot is good value for the money, especially for the ability to share graphics with other platforms. It might not be money well spent on a bottom-end system, but on the other hand, it might be the reason you need to upgrade.

-Jason Compton



The image of a Navajo indian woman (right) was filtered using the watercolor module (below right).





Among the graphic images included with GoDot is this amazing rendering of three champaign glasses (left).

HARD TIPS

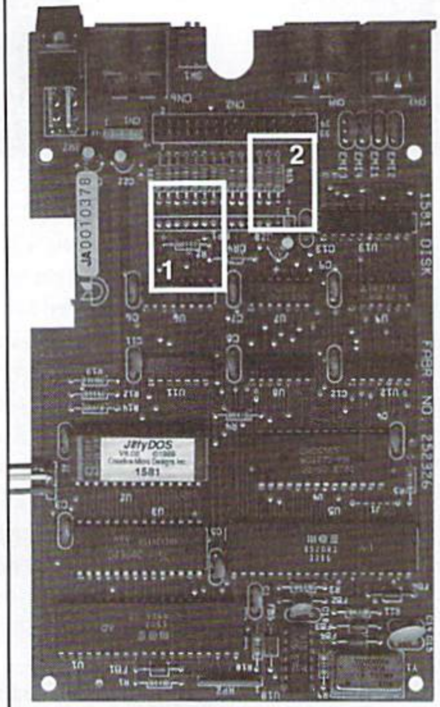
by Doug Cotton & Mark Fellows

INSTALLING A STANDARD PC DRIVE MECHANISM IN A COMMODORE 1581

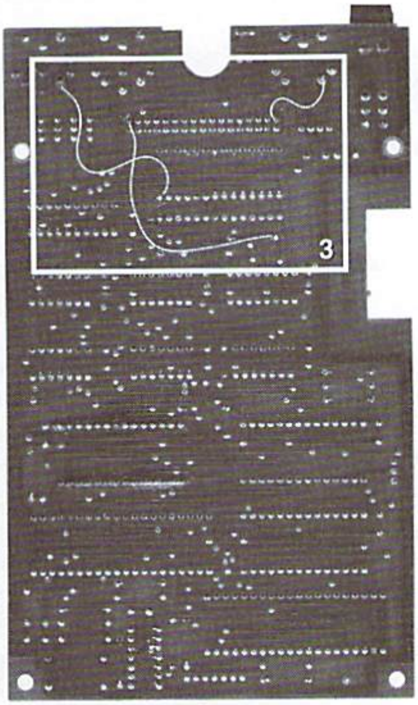
In this installment of Hard Tips we present a means of connecting a standard 'PC' floppy disk drive mechanism to a 1581 disk drive controller.

We used a Teac FD235HF-6240-U5 mechanism, which is both a double-density and high-density mechanism. In using such a mechanism, there are a couple of important things to note: (1) The controller in the 1581 is only capable of working in double-density mode, and (2) the pin-out of modern drives differs in some respects from the drives originally installed in the 1581. The instructions presented here provide the modifications necessary to adapt the 1581 controller board for these differences.

Once the modifications have been performed, there are a couple of additional issues to deal with. First, the ribbon cable that attaches the drive mechanism to the controller board may need a 180-degree twist in order to plug into Connector CN2 correctly. It's important to verify this to avoid damaging your 1581 controller card. Second, there is near zero chance that you'll find a mechanism that will match up with the physical layout of the 1581 front panel, so you'll either have to run without a front, or you can do some fancy cutting with the 1581's front panel to allow access to newly installed mechanism (see picture on the front cover).

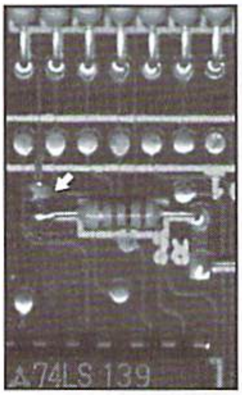


1581 Controller - Top Side



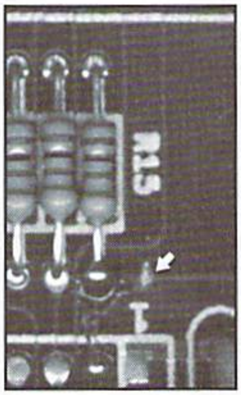
1581 Controller - Bottom Side

1



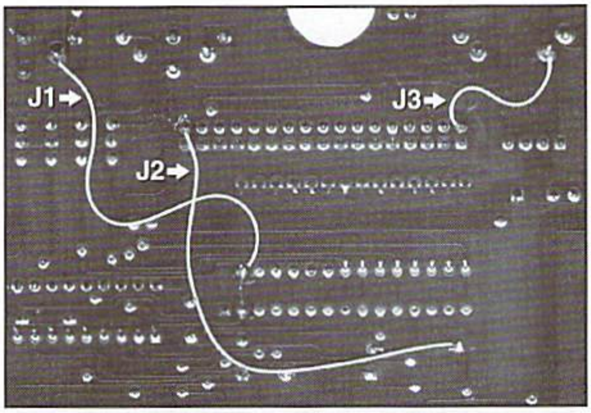
Cut the trace leading to R2 on the top of the circuit board. This trace comes from pin 3 of Connector CN2. You can see this cut just above the left leg of R2 in the picuture above.

2



Cut the trace leading to R15 on the top of the circuit board. This trace comes from pin 34 of Connector CN2. You can see this cut just to the right of the bottom leg of R15 in the picture above.

3



Solder three jumpers onto the bottom of the 1581 circuit board:

- Jumper J1 - Connect the end of R15 farthest from CN2 to GROUND. This provides a constant READY signal.
- Jumper J2 - Connect pin 34 of CN2 to the open end of R2. This completes the process of re-routing the DISK CHANGE signal.
- Jumper J3 - Connect pin 2 of CN2 to GROUND. This will force the drive mechanism into double-density mode.

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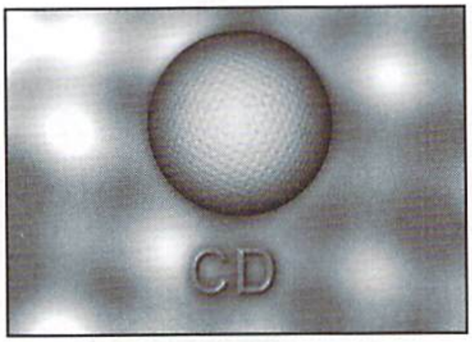
Carrier Detect

By Gaelyne R. Gasson

GETTING MORE OUT OF PINE

This issue we're going to explore Pine, one of the most feature-rich Email programs available for text-based Internet use. This isn't a Commodore program, Internet providers have it online for shell account customers to use when reading and replying to Email. It has easy to follow menu choices at the bottom of every screen, and an easy to use editor named "pico" with the same type of menu system.

Recently I started using a new system after several years of being quite comfortable with my personal set up of Pine. I discovered all over again what it's like to be a "new user" and thought it would be good to review some of Pines' more useful features and those items that sometimes cause confusion.



Get the Latest

If the version of Pine on your Internet provider is under v4.00, ask your System Administrator to install the current one (v4.05 as of this writing). Pine v4.00 came out last July and has the ability to launch your online web browser (usually Lynx) while reading Email. This is handy when you come to a web page reference in Email that you'd like to view. When you quit Lynx, you're returned to the Email message. Sweet!

Another new feature is the ability to access remote Email boxes (if you have more than one Internet account) using POP3. However, the documentation suggests you should use a program named fetchmail instead, as this feature is still in the development stage. Fetchmail is a Unix utility that retrieves mail from other Email accounts you have, and yes, if it's available on your ISP, you can use it.

If you've ever wondered if we could use PGP (Pretty Good Protection) encryption, the answer is yes, with CryptoPine (*http://www.arquired.es/users/dani/linux/*). Using PGP you can exchange encrypted Email, and it gives you the ability to sign Email that others can verify. This means people have a way to check that it was really you who sent the message.

Starting Pine

Normally, you start Pine from the command line by typing the word "pine" and pressing return. If you've been using it for awhile, you might have noticed 'pine-debug' files in your home directory. These can be ignored or you can turn them off by starting Pine with the command:

```
pine -d 0
```

Note that there's a space between the letter d and number zero. If you haven't seen these files in your home directory, ignore this suggestion as your system administrator has compiled Pine without this um, feature.

Config Settings

From Pine's Main Menu, select <s> for Setup, then <c> for Configure. You'll find a long list of various things you can change about how Pine works. Some items will need a word or file name typed in. To do this, press the letter <c>" to change a text item, or you can add additional items by pressing <a>. Other options are toggled on or off with the return key when the item is highlighted. Some of the phrases used in the configuration list are mind-blowing, but you can get a description of what an option does by highlighting it and pressing the question mark. In the rest of this article, if there's an option that needs to be changed from the configuration menu, it's listed just below the article heading. In addition to this method, you may have a file in home directory named .pinerc that's also used to change how Pine works for you. In this article, we'll stay with the program's configuration menu.

Quick Searches

To make things a little easier to find in Pine, pressing <w> (or <CTRL><w>) lets you search for words (or phrases), and will position the cursor on the first instance it finds. Using the keystroke again takes you to the next occurrence of the word (or you can use search for another word). Search is available almost everywhere in Pine, including while viewing lists, reading or replying to mail and in the configuration menu.

Telling Pine to behave more like Lynx

The following four options make Pine behave similar to Lynx by highlighting URLs and file attachments so you can select them for viewing:

```
url-viewers= /usr/bin/lynx
enable-msg-view-attachments
enable-msg-view-urls
enable-msg-view-web-hostnames
```

The first option is one you'll need to type, and the path to Lynx must be specified. To find out where Lynx is on your ISP, from the command line, type:

```
whereis lynx
```

or

```
which lynx
```

If this doesn't tell you the directory that Lynx resides in, ask your System Administrator for the information. The last item (*enable-msg-view-web-hostnames*) will highlight URLs that don't begin with "http://". For instance, a message with text commenting about a file at "www.somewhere.com" will still appear as a link.

Creature Comforts

enable-sig-dashes - If you use a signature and have this enabled, your signature will be attached to the message with two dashes and a space on the line before the signature. When replying to mail that includes this line, anything below it isn't included in the quoted text. A disadvantage is when replying to mail that has more than one message within it, and you want to respond to an item below the first dashed line. It's especially noticeable when replying to mailing lists that use a digest format with several "messages" in one Email.

enable-tab-completion - This is a nifty command that makes it easy to type in file or folder names. Once this is enabled, to make use of it, when exporting a message to your home directory, type in part of the name then press the tab key. The file name auto-magically appears. I often save messages to a temporary file named "temp.txt". With this option, I need only type "tem" and press the tab key for the entire name to appear. Tab-completion works in many Unix programs and it's worth trying anytime you can't remember the full name, or don't feel like typing the entire name. If there's more than one file matching the letters you've typed, the information will be filled in as far as the match and you can type another character or two and press the tab key again until the entire name appears.

enable-arrow-navigation - Now that Pine acts similar to Lynx in allowing you to select URLs and files, the commands to exit the file viewer changed to the greater-than (>) and less-than keys (<), or their un-shifted equivalents of the comma (,) and period (.). With "*enable-arrow-navigation*" turned on, you can use your cursor keys (or the <4> and <6> on the C128 keyboard) to exit out of the viewer screen. It's similar to Lynx keystrokes for returning to a previous web page.

Enable-arrow-navigation changes how the cursor keys work when viewing a list of files or folders. Instead of being able to move up or down a list of files, the right cursor key is used. I turned this option off because of this effect, but you might want to give it a try.

enable-msg-view-forced-arrows - This turns highlighting and linking off for the up and down cursor keys while reading mail. You can still access the links with <CTRL><f> (next link) and <CTRL><b> (previous link), but it's not as convenient.

Selecting and Applying Commands to Messages

enable-aggregate-command-set - With this option turned on, you can select multiple messages to apply a command to several messages all at the same time. It's useful for exporting or deleting many messages all at once, and you can also "zoom in" to see only the messages you've selected. It's not as easy to use as it could be, but it's certainly a move in the right direction. I find the more I use it, the more comfortable I become with it.

Individual messages are selected with the colon key (:). For multiple message selection, use the semi-colon key (;). A small menu at the bottom of the screen lets you determine which messages to select. The choices are: Current message, All, message Number, Text (includes Header text), Status or Date. Each of these have further options, such as selecting all messages that are To, From or CC'd to the same address as the current message is on. Once messages are selected this way, they appear as either bold, underlined or highlighted, depending on your terminal emulation.

To apply a command to the selected Emails, press the <a> key (for apply) and select from the options that appear on the menu at the bottom of the screen. A few of the options given (depending on your configuration) include: Delete, Undelete, Forward, Reply, Save, Export, and Take address. Press the <z> key to "zoom in" and view a list of just the selected messages.

Sorting it Out

sort-key (permanent change) or *$* (temporary sorting) - Generally, I prefer to read my mail in the order that it's arrived, but there are times such as when I've been away for a few days that I need a more organised approach. The sort-key option in the configuration menu has several options for the order the mail is listed in. Sometimes it's easier to keep the sort-key set at the default setting ("arrival") and use the "$" (<SHIFT><4>) command while viewing the message list. This gives the same options but it's a temporary change. One advantage of using the "$" command to sort a list of messages, is you can then see messages grouped together so you can select them to perform other operations. If you need to get a series of messages in a certain order (such as by date) to export them to a text file, this can be a real help.

Telling Pine to Quote Messages in Replies

include-text-in-reply - When I first looked for this command, I used the word "quote" because it seemed logical, but this is the option to select if you want to quote a message you're replying to. Pine offers other choices such as the ability to include headers or file attachments in replies, but this is the most useful one.

Quoting Only a Few Lines

When all of the text is included in the message, it's polite to delete excess text from your reply. Use <CTRL><k> to delete extra lines of text. More information on using cut and paste are given below.

Recognizing Commodore Files in Pine (and Lynx)

mimetype-search-path = /home/yourname/mime.types - If you send or receive Commodore files via Email, it's best to let Pine know what files can be sent (or displayed) as text, and which it should handle with care and not change in any way (binary). "Application/octet-stream" means to treat it as a binary file, not as text. There's an option in Pine's configuration menu that asks for the path and name of your mime-types file. This is a short text file listing filename extensions (like .arc, .sfx, .sda, .prg etc.) that's used by Pine and Lynx to determine whether to display a file (text) or treat it as binary file.

You can download the mime.types file from *http://ftp.videocam.net.au/cbm/mime.types* or you can create one using pico. Create a file with the name 'mime.types' in your home directory. Here's an example of what to type:

```
application/octet-stream c64 arc ark sfx sda
 prg lnx sdi 128 cvt wr3
```

Back in Pine, change the path for the *mimetype-search-path* to match your system. In some Pine setups, the *mimetype-search-path* doesn't exist. In this case, have a chat with your system administrator and explain that you'd like the Commodore extensions added to the system's MIME definition table or *mime.types* file. Give them the list of Commodore extensions above (with any additional ones you've added). Keep the *mime.types* file in your directory, as Lynx will make use of it as well.

Sending Files

Files are sent by attaching them to your Email message. Here are the steps you'll need to take to do this successfully:

1) Upload the file. If you're using Novaterm, have it set for NO translation (this only applies to binary files and text files you don't want altered in any way).

2) Start pine with:

```
pine friends.email@address.here
```

Naturally you'll need to substitute the actual Email address of the person you're sending the file to.

3) While your cursor is still in the header (the To/Subject area of the message), press <CTRL><j>.

4) Attach the file
   a) A line will appear at the bottom of the screen asking:

```
File to Attach:
```

   If you know the name (you did give it a really easy filename, right?) type it in.
   b) If you can't remember the name, press the <CTRL><t>. This gives you a list of your directory and you can cursor to the file and press return over it.
   c) A new prompt will appear: "Attachment comment:" Type the name of the file here. This is used to tell the mail program your friend uses what the filename is. Don't use a description - use the actual filename. At the bottom of your screen, you should see text similar to:

```
[File /home/yourname/geewhiz.prg attached
as type APPLICATION/octet-stream].
```

   If it's a text file it would say

```
[File /home/yourname/geewhiz.prg attached
as type TEXT/PLAIN].
```

   d) In the body part of the message, write a short note to your friend:

```
This is the latest Geewhiz program I want you
to try out.
```

   Press <CTRL><x> to send it.

Receiving Files

If the file is a BASE64 MIME file that Pine recognises, you won't see any encoded information (as you would if it were a uuencoded file). Instead, you'll see a notice from Pine at the top of your message similar to:

```
Part/Attachments:
1   shown          44 lines       text
2   OK             13 kb          application
```

If you've enabled the *enable-msg-view-attachments* option, these are presented as links you can cursor to and select. Otherwise, you can press <v> for view. In either case, highlight the file name, and then press the letter <s> for save. The file is saved in your home directory. Exit Pine, and download the file.

Using Pipe Commands to Decode Files

enable-unix-pipe-cmd - Pine doesn't recognise uuencodes or QWKRR v5's Base64 MIME format, but you can still decode these files while reading mail. To do this, you'll need to have "*enable-unix-pipe-cmd*" enabled.

The online programs you'll need are munpack or metamail for MIME files, and uudecode for uuencode files.

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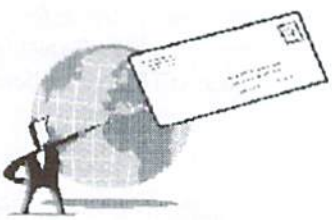

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The pipe symbol is used to tell Pine you want to "pipe the message to a Unix command". The keystroke for the pipe symbol (it looks like "|"), varies depending on your term program. In Novaterm, it's the <SHIFT><£>, in Desterm it's <ALT><.> (period) and in Dialogue, it's <SHIFT><@>.

When you receive a file in Email and want to decode it, type "|" (the Pipe command) and Pine will respond with a message at the bottom of the screen similar to:

```
   Pipe message 12 to:
```

Enter the name of the program you want to use, such as uudecode, munpack, or metamail. Pine may give an 'error message', but usually the file has decoded just fine. To find out, exit Pine and list your home directory. You should find the file with the same name as what was given within the message.

Stop Getting Dead Letter Files

quell-dead-letter-on-cancel - By default if you start an Email and then cancel it without sending, Pine will save the cancelled letter in your home directory as "dead.letter". If you turn this option "on", it will put an end to dead.letters cluttering up your directory.

How to Use Search and Replace in Pine (and Pico)

enable-search-and-replace - Search and replace is a new feature, and to enable it you need to set the option in the configuration menu. To use it while editing a message, press <CTRL><w> (for search), and enter the text that you want to find. Before pressing return, press <CTRL><r>. This changes the prompt to:

```
   Search (to replace):
```

Now press return. The first instance of the word or string you want to replace is highlighted, and you are prompted:

```
   Replace <text string> with:
```

Type in the replacement string, then (to replace all instances) press the <CTRL><x> keys. Press <RETURN> to enter. You will be prompted again to confirm each replacement. Hopefully all the extra prompting will be removed in future versions when you've selected <CTRL><x> for "replace all".

Useful Editing Commands

<CTRL><a>	Go to beginning of a line
<CTRL><e>	Go to the end of a line
<CTRL><y>	Go to top of the message
<CTRL><v>	Go to end of the message.
<CTRL><w>	Search

Cutting and Pasting Entire lines

<CTRL><k>	delete lines of text
<CTRL><u>	restore text deleted with <CTRL><k>

Highlight method

Move the cursor to where you wish to start cutting text (this can be in the middle of a line). Press <CTRL><^>. (The <^> key is the Up-Arrow key near the Restore key. On non-Commodore keyboards, it's <SHIFT><6> or <^>.) Now move the cursor keys to highlight text (in any direction) and position the cursor so it's one character after what you want to cut. Press <CTRL><k> to cut/delete the highlighted text. To paste the text, place cursor where you want the text, and press <CTRL><u>.

While the text is highlighted, you can use <CTRL><y> or <CTRL><v> to page up or down and can also use <CTRL><w> to search for text, to make selecting a large chunk for deletion or copying faster. To highlight to the end of the file, highlight the text and press <CTRL><w> followed by <CTRL><v>.

Online Pine Resources

A few months ago when I switched systems and started using the updated version of Pine, the thought briefly crossed my mind I should check into the docs and see what new features were there for me to use. As usual though, I had too much to do and not enough time to do it in and didn't make the time. Looking back in hindsight, a few minutes reading the docs could have had me using some of the best time-saving features of Pine ages ago. Maybe this article has saved you a minute or two in your day. Enjoy!

Useful Pine Document Locations

http://www.washington.edu/pine/faq/
http://www.washington.edu/pine/
http://www.mcmaster.ca/cis/help/pinestrt.htm

Gaelyne Gasson is the author of "The Internet for Commodore C64/128 Users". Her Home page is at http://videocam.net.au/gaelyne/

Gaelyne Gasson is the author of "The Internet for Commodore C64/128 Users" and can be contacted via Email at gaelyne@cmdweb.com or visit her web site at: http://videocam.net.au/~gaelyne.

Mental Health Hotline Automated Answering System

Hello, and welcome to the Mental Health Hotline....

- If you are obsessive-compulsive, press 1 repeatedly.
- If you are co-dependent, please ask someone to press 2 for you.
- If you have multiple personalities, press 3, 4, 5 and 6.
- If you are paranoid, we know who you are and what you want ... Stay on the line so we can trace your call.
- If you are delusional, press 7 and your call will be transferred to the mother ship.
- If you are schizophrenic, listen carefully and a small voice will tell you which number to press.
- If you are a manic-depressive, it doesn't matter which number you press... no-one will answer.
- If you have a nervous disorder, please fidget with the hash key until a representative comes on the line.
- If you have amnesia press 8 and state your name, address, phone number, date of birth, social security number and your mother's maiden name.
- If you have post-traumatic stress disorder, slowly and carefully press 000.
- If you have bi-polar disorder, please leave a message after the beep or before the beep ... Or after the beep ... Please wait for the beep.
- If you have short-term memory loss, press 9... If you have short-term memory loss, press 9... If you have short-term memory loss, press 9... If you have short-term memory loss, press 9...
- If you have low self esteem, please hang up ... All of our operators are too busy to talk to you.

CHECKSUM

Commodore World s Program Entry Checking Program and Tips on Entering Programs from this Magazine

CHECKSUM is a program that proofreads your typing when you enter a listing from the magazine. It assigns a numerical value to each character that you type, adds up the values of the line you typed and displays the sum. (Checksum, therefore, means that it checks your typing by summing the characters.) It also verifies that you have typed the characters in the proper order. (Checksum won't tell you if you miss a line of code entirely, so verify that yourself.) Checksum runs "in the background" when you type in lines of program code. Whenever you type a line and press RETURN, Checksum will display a value. Compare that value to the value published next to the line of code in the magazine. If the numbers match, you've typed the line correctly. Simple.

Typing in CHECKSUM

First, type in Checksum carefully from the listing on this page. Be sure to press RETURN after every line to enter it into memory. Once you have typed the program, *save it*. In fact, save it a few times while you're typing, just to be safe. (This is good advice whenever you type in a program. I usually change the name each time I save; for example, Checksum1, Checksum2, and so on.) Double-check your work, making sure that you've typed in every line and that you've pressed RETURN after every line you've typed. If you make errors when typing in Checksum, a test run of Checksum will tell you which line is incorrect. (This safety feature works only in the Checksum program itself, and does not apply to any other listings in the magazine.) Whenever you find a typing error (in any program listing), fix it, press RETURN to enter the change, save the program again and try another run. Repeat this process as often as necessary. Important tip: Don't get discouraged if the program won't run. Be patient. Be thorough. It will work eventually. You'll know your Checksum is ready when you see the line:

```
TO TOGGLE ON OR OFF, SYS XXXX
```

Entering Programs Using CHECKSUM

When you're ready to type in your first listing from the magazine, load and run Checksum. Make a note of the number that is displayed on the screen (49152 for the C-64; 3328 for the C-128). To activate and deactivate Checksum, type SYS followed by that number, then press RETURN. You need to have Checksum active whenever you're typing in a listing. Checksum must be deactivated, however, when you run the new program. The next step is typing in a new program listing as it appears in the magazine.

As you begin, you'll notice that to the left of the start of each line is a number. Don't type this number in: It's simply the Checksum value. Stop typing at the end of the program line and press RETURN. If you've typed the line correctly, the number displayed on the screen will match the Checksum value. If the numbers don't match, you've made a mistake. Check the line carefully, make your changes and press RETURN. The computer won't know you've made a change unless you press RETURN on the changed line to enter it. A few type-in hints: The Checksum does not verify blank spaces in the program lines unless they are within quotation marks, because adding or omitting such spaces will not affect the operation of the program. The exception to this is hexadecimal Data statements. These are the Data statements, such as this one, that don't have commas:

```
100 DATA 12345678901234567890*123456789012345
67890*12345678901234567890*
```

In statements such as these, you must have one space between the word DATA and the numbers that follow. Checksum will not catch that error.

Special Key Combinations

As you type, you may be confused the first time you see curly braces {}. These braces mean "perform the function explained within." For example, {22 SPACES} means that you need to press the space bar 22 times. Don't type the braces (you can't, of course, because there are no curly braces in the Commodore character set). Here are some other common examples:

{CLEAR/HOME}	hold down the SHIFT key and press the CLR-HOME key.
{2 CRSR DN}	tap the cursor down key twice.
{CTRL i}	hold the CONTOL key and press the I key.
{CMDR t}	hold down the COMMODORE key and press the T key.

Continue typing in your program, saving often and checking each checksum value with the one in the magazine, until you've finished the listing. Phew! So now you're ready to run your program, right? Not quite. First, save it. Second, deactivate Checksum by typing SYS followed by 49152 for the C-64 or 3328 for the C-128. Now you can run. Don't be discouraged if you still get an error. It happens. Use Checksum faithfully. Be patient. Be thorough. It will work eventually.

CHECKSUM

```
100 rem cw checksum 64/128
110 mo=128:sa=3328
120 if peek(65533)<>255 then mo=64:sa=49152
130 i=0:ck=0:ch=0:ln=300
140 for k=0 to 16
150 for j=1 to 10
160 read b:if b>255 then goto 280
170 ch=ch+b:poke sa+i,b:i=i+1
180 next j
190 read lc:if lc<>ch then goto 280
200 ch=0:ln=ln+10
210 next k
220 pokesa+110,240:pokesa+111,38:pokesa+140,234
230 printchr$(147):print"cw checksum";str$(mo):print
240 print"to toggle on or off, sys";sa:if mo=128 then 270
250 pokesa+13,124:pokesa+15,165:pokesa+25,124:pokesa+26,165
260 pokesa+39,20:pokesa+41,21:pokesa+123,205:pokesa+124,189
270 pokesa+4,int(sa/256):sys sa:new
280 print"you have a data error in line";ln;"!":end
290 rem do not change these data statements!
300 data 120,162,24,160,13,173,4,3,201,24,884
310 data 208,4,162,13,160,67,142,4,3,140,903
320 data 5,3,88,96,32,13,67,152,72,169,697
330 data 0,141,0,255,133,176,133,180,166,22,1206
340 data 164,23,134,167,132,168,170,189,0,2,1149
350 data 240,58,201,48,144,7,201,58,176,3,1136
360 data 232,208,240,189,0,2,240,42,201,32,1386
370 data 208,4,164,180,240,31,201,34,208,6,1276
380 data 165,180,73,1,133,180,230,176,164,176,1478
390 data 165,167,24,125,0,2,133,167,165,168,1116
400 data 105,0,133,168,136,208,239,232,208,209,1638
410 data 169,42,32,210,255,165,167,69,168,170,1447
420 data 169,0,32,50,142,169,32,32,210,255,1091
430 data 32,210,255,169,13,32,210,255,104,168,1448
440 data 96,104,170,24,32,240,255,104,168,96,1289
450 data 56,32,240,255,138,72,152,72,24,162,1203
460 data 0,160,0,32,240,255,169,18,208,198,1280
```

816 BEAT

By Doug Cotton

PPSWPATCH: 24-BIT ADDRESSING FOR PEEK, POKE, SYS & WAIT

In this installment of 816 Beat we present PPSWPATCH, a patch utility that extends the capabilities of Commodore BASIC (v2.0) to allow certain commands to work with the extended RAM in a SuperCPU. In short, this patch adds 24-bit addressing to PEEK, POKE, SYS and WAIT. In addition, it patches the BASIC number evaluation routines so that hexidecimal values can be used in many commands. By modifying BASIC in this manner, programmers can now store and retrieve data using extended memory without having to resort to machine language. In addition, programmers can integrate machine language subroutines that reside in extended memory.

The BASIC listing on this page, PPSWPATCH.CREATE, can be used to create the PPSWPATCH program. Just type in the listing (use our CHECKSUM utility to avoid errors), then RUN it. The program will ask you which device you wish to have the patch program created on. Once you have provided the device number, the actual PPSWPATCH program will be written to that device. After this, you may discard the creator program, since it is no longer needed.

Using The Patch

Once the PPSWPATCH program has been created, simply LOAD and RUN the program to install the patches. You may now use 24-bit addresses in any PEEK, POKE, SYS and WAIT statements in either DIRECT or PROGRAM modes. Since the patches include converting hexadecimal values, addresses may be specified in either decimal or hexadecimal format. To specify a hexadecimal value, simply precede the value with a dollar sign ($). For example:

```
PRINT PEEK($C000)
```

This causes the contents of memory location 49152 (the decimal equivalent of $C000) to be printed to the screen.

As an added benefit, hexadecimal values will also work throughout most other BASIC commands, which means you can do things like:

```
PRINT $C000
```

The computer will respond by printing the value 49152 on the screen. You may also mix values in mathematical expressions. For example:

```
PRINT ($10+10)*$10
```

Here the result printed to the screen is 416 (16+10=26, 26*16=416). ***Note:*** *Hexadecimal values do not work within DATA statements, because the READ command parses this data itself.*

Working With SYS

When you use a SYS command to call a machine language routine, the new patch analyzes the address supplied to determine which Bank of memory the routine you're calling resides in. If the address is in Bank 0, a standard SYS is performed. However, if the address resides in any other Bank, the patch places the processor into native 65816 mode, then performs a JSL (Jump to Subroutine Long) command to execute the routine. Native mode is used to avoid ending up stuck in Bank 0 when interrupts get processed. JSL is used so that program execution returns to Bank 0 after the user routine completes. For this to work properly, you'll need an RTL (ReTurn from subroutine Long) at the end of routines located outside of Bank 0 (instead of an RTS). The opcode value of the RTL instruction is $6B (107 decimal). This will cause program execution to return to the new SYS routine in Bank 0,

```
√Σ    PPSWPATCH.CREATE

75    10 PRINT"{CLEAR/HOME}";
69    20 PRINT"READY TO BUILD PPSWPATCH"
234   30 PRINT"SAVE ON WHICH DEVICE";:INPUTDV
153   40 IF DV<8 OR DV>29 THEN GOTO 10
89    50 OPEN8,DV,8,"PPSWPATCH,P,W"
21    60 READ A$:PRINT".";:IF A$="END" THEN CL
      OSE8:GOTO120
137   70 FORI=1TOLEN(A$)STEP2
21    80 H=ASC(MID$(A$,I,1))-48:IFH>9THENH=H-7
192   90 C=C+H:L=ASC(MID$(A$,I+1,1))-48:IFL>9T
      HENL=L-7
252   100 C=C+L:V=L+H*16:PRINT#8,CHR$(V);
195   110 NEXT:GOTO60
215   120 PRINT:IFC<>3171THENPRINT"ERROR IN DA
      TA!",C
3     130 END
198   140 :
150   1000 DATA 01080D08640C9E32303633AA20000
192   1010 DATA 008D7ED0A26FBD86089D00D3CAE0FF
1     1020 DATA D0F58D7FD0AD0A038D3403AD0B038D
121   1030 DATA 3503A9008D0A03A9D38D0B03A90148
234   1040 DATA ABA9998DFEB7A94C8D04B8A9488D05
64    1050 DATA B8A9D38D06B8A9A78D18B88D40B8A9
65    1060 DATA 508D19B88D41B88D2BB8A9878D2AB8
46    1070 DATA A9DC8D44E1A9508D45E1A94C8D30E1
35    1080 DATA A9598D31E1A9D38D32E1A90048AB60
208   1090 DATA 207300C924D031A9C0850EA9008561
52    1100 DATA 850D207300F0429002E908E92FC910
162   1110 DATA 9009C9F7D034A20E6C000348A943A0
121   1120 DATA D32028BA68207EBD4C11D3A67AD002
97    1130 DATA C67BC67A6C340385000000000A56385
80    1140 DATA 52A564A465841484508515855160A5
136   1150 DATA 52D006A9E1484C33E118FB2236E100
148   1160 DATA 0838FB4C48E1
137   1170 DATA "END"
```

where the processor can be switched back to Emulation mode, and control can be returned to BASIC.

Since the SYS command turns over control to user routines, care must be taken to avoid problems that could cause system crashes. To assist programmers in this respect, here are some simple guidelines:

1. Always end machine language routines that will be located outside of Bank 0 and called by SYS with an RTL (ReTurn from subroutine Long) instead of an RTS. ***Note:*** *Intermediate subroutines within your routine may still use RTS provided they reside within the same Bank as the calling routine (see SYS Programming Example).*

2. Never call or jump to a Commodore Kernal routine from any routine running outside of Bank 0. If you need to access Kernal routines, build a Kernal Interface Table (KIT) in Bank 0 (*see SYS Programming Example*), and make sure that memory and register accesses are set for 8-bit operation.

3. Never switch the processor to Emulation mode when executing code outside of Bank 0. Any IRQ or NMI that occurs while doing so will end up returning to the wrong Bank after the interrupt has been processed.

4. Always fix any changes you make to the processor before exiting from your routine. For example, if you make a hard change to the DBR (Data Bank Register), change it back before exiting from your routine.

Provided you follow these guidelines, you should be able to easily create machine language subroutines in extended memory that can be called from BASIC (*see SYSEXAMP.BAS*). The SYS Programming Example source code provides a good blueprint for creating such subroutines. It creates a small Kernal Interface Table (KIT) at $00C000 for interfacing with two Kernal routines (GETIN and BSOUT) that are used by the subroutine. It then calls GETIN via the KIT to obtain user input, and checks the input. If the input is invalid, program execution branches back to get more input; if valid, it calls BSOUT via the KIT to print the character to the screen. If the input was the RETURN key, the program terminates; otherwise it branches back for additional input.

Hey, WAIT a Minute!

While the patch also covers the WAIT command, there is actually very little value to having 24-bit addressing for it. Under regular conditions, there really aren't any addresses above Bank 0 that automatically change. However, it has been included since an interrupt routine could be modified to cause changes to higher addresses, and it's possible some programmers may find that necessary or useful.

```
√Σ    SYSEXAMP.BAS

110   1000 L=$030000
153   1010 READV:IFV=-1THEN1030
213   1020 POKEL,V:L=L+1:GOTO1010
87    1030 SYS($030000)
148   1040 END
80    1050 :
86    2000 DATA 32,20,0,34,4,192,0,240
60    2010 DATA 250,72,34,0,192,0,104,201
30    2020 DATA 13,208,240,107,162,0,191,36
227   2030 DATA 0,3,208,1,96,159,0,192
152   2040 DATA 0,232,208,242,32,210,255,107
199   2050 DATA 32,228,255,107,-1
```

Freely Distributable Source

In addition to the PPSWPATCH.CREATE program, we have also supplied the complete source code for the PPSWPATCH utility (*see following pages*). Programmers who are interested in how the utility works, or who wish to integrate any part of the code into their own projects, may refer to and freely use this source code.

Updates

We're looking into fixing the READ statement for hexadecimal values, and rudimentary patches for LOAD and SAVE are already in development. So be sure to watch this column in future issues of Commodore World for these additional capabilities that will provide even more advantages to programming with SuperRAM!

```
; SYS Programming Example

            .org     $0000         ;eventually $030000
            .obj     'sysexamp.o'

; simple test
            jsr      maketable
-           .byte    $22           ;JSL
            .byte    $04,$c0,$00   ;$00c004 (new GETIN)
            beq      -
            pha
            .byte    $22           ;JSL
            .byte    $00,$c0,$00   ;$00c000 (new BSOUT)
            pla
            cmp      #13
            bne      -
            .byte    $6b           ;RTL

; set up a Kernal Interface Table (KIT) in Bank 0
maketable   ldx      #0            ;clear counter
-           .byte    $bf           ;LDA (abs long ind,x)
            .word    tabledata     ;Low-High byte address
            .byte    $03           ;Bank address
            bne      +
            rts
+           .byte    $9f           ;STA (abs long ind,x)
            .byte    $00           ;low byte
            .byte    $c0           ;high byte
            .byte    $00           ;Bank 0
            inx
            bne      -

; data for making KIT
tabledata   .byte    $20           ;JSR
            .word    $ffd2         ;BSOUT
            .byte    $6b           ;RTL
            .byte    $20           ;JSR
            .word    $ffe4         ;GETIN
            .byte    $6b           ;RTL
            .byte    $00           ;end of table
```

```
; PPSWPATCH
; Version 1.0.2
; Last Modified 02/17/1999
; Stephen L. Judd
; Mark A. Fellows
; Doug Cotton
;
; Patches PEEK, POKE, SYS and WAIT
; in BASIC v2.0 to allow for 24-bit
; addresses. Also modifies numeric
; evaluation to accept hexadecimal
; values (preceded by $).


            .org    $0801
            .obj    'ppswpatch'

dest        =       $d300

linnum      =       $14         ;variable
num24       =       $50         ;new 24-bit dest.
chrget      =       $73
txtptr      =       $7a
getadr      =       $b7f7
peek        =       $b80d
poke        =       $b824
wait        =       $b82d


; getadr patch -> getadr+7
p1adr       =       getadr+7
patch1      =       $99         ;cmp #$91 -> cmp #$99

; getadr patch -> getadr+$0d
p2adr       =       getadr+$0d
patch2      =       $4c         ;jmp linfetch

; peek patch -> peek+9
p3adr       =       peek+11
patch3a     =       $a7         ;lda [$50]
patch3b     =       num24

; poke patch -> poke+4
p4adr       =       poke+6
patch4a     =       $87         ;sta [$50]
patch4b     =       patch3b

; wait patch -> wait+17
p5adr       =       wait+19
patch5a     =       patch3a     ;lda [$50]
patch5b     =       patch3b


; BASIC header

            .word   link
            .word   3172        ;line number
            .byte   $9e         ;sys
            .byte '2063:'
            .byte   $a2         ;new
            .byte 0
link        .word 0


; copy code to dest

            sta     $d07e       ;scpu hw enable

            ldx     #endcode-code
-           lda code,x
            sta     dest,x
            dex
            cpx     #$ff
            bne     -

            sta     $d07f       ;scpu hw disable


; init ieval vector

            lda     $030a       ;old ieval
            sta     $0334
            lda     $030b
            sta     $0335
            lda     #<hexeval
            sta     $030a
            lda     #>hexeval
            sta     $030b


; set DBR to Bank 1 for patches

            lda     #$01
            pha
            .byte   $ab         ;plb (DBR)


; patch BASIC 'ROM' (in Bank 1 RAM)

            lda     #patch1     ;getadr
            sta     p1adr
            lda     #patch2
            sta     p2adr
            lda     #<linfetch
            sta     p2adr+1
            lda     #>linfetch
            sta     p2adr+2
            lda     #patch3a    ;peek+wait
            sta     p3adr
            sta     p5adr
            lda     #patch3b
            sta     p3adr+1
            sta     p5adr+1
            sta     p4adr+1     ;poke
```

```
          lda     #patch4a
          sta     p4adr

; patch sys

          lda     #$dc        ;jmp []
          sta     $e144
          lda     #num24
          sta     $e145

          lda     #$4c
          sta     $e130
          lda     #<syspat
          sta     $e131
          lda     #>syspat
          sta     $e132

; set DBR back to Bank 0

          lda     #$00
          pha
          .byte   $ab         ;plb (DBR)

          rts

code      .off    dest        ;offset code for dest


; patch eval to read in hex values

hexeval   jsr     chrget      ;get character
          cmp     #'$'        ;is it hex?
          bne     nope        ;no - branch
          lda     #$c0        ;yes
          sta     $0e         ;128+64 = 24-bit int.
          lda     #0
          sta     $61         ;fac1=0
          sta     $0d         ;valtyp = numeric

loop      jsr     chrget
          beq     linrts
          bcc     number
          sbc     #8          ;a-f will be 10-15

number    sbc     #47
          cmp     #16
          bcc     ok          ;can use e.g. $d0+5 now
          cmp     #$f7        ;check for decimal pt.
          bne     linrts

error     ldx     #14         ;illegal quantity
          jmp     ($0300)

ok        pha
          lda     #<sixteen
          ldy     #>sixteen
```

```
          jsr     $ba28       ;multiply fac1 by 16
          pla
          jsr     $bd7e       ;add to fac1
          jmp     loop

nope      ldx     txtptr      ;back up txtptr
          bne     skip
          dec     txtptr+1

skip      dec     txtptr
          jmp     ($0334)     ;normal routine


; 16 in 5-byte floating point format
sixteen   .byte   $85,$00,$00,$00,$00


; copy bytes of fac1 into linnum and num24
; on exit, .y .a = linnum+1, linnum

linfetch  lda     $63         ;high
          sta     num24+2
          lda     $64         ;med
          ldy     $65         ;low
          sty     linnum
          sty     num24
          sta     linnum+1
          sta     num24+1

linrts    rts


syspat    lda     num24+2
          bne     +
          lda     #$e1
          pha
          jmp     $e133

+         clc
          .byte   $fb         ;xce 65816 Native mode
          .byte   $22         ;JSL to
          .byte   $36,$e1,$00 ;SYS addr.
          php
          sec
          .byte   $fb         ;xce back to 6502 Emulation
          jmp     $e148


          .ofe    ;re-org

endcode   =       *
```

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